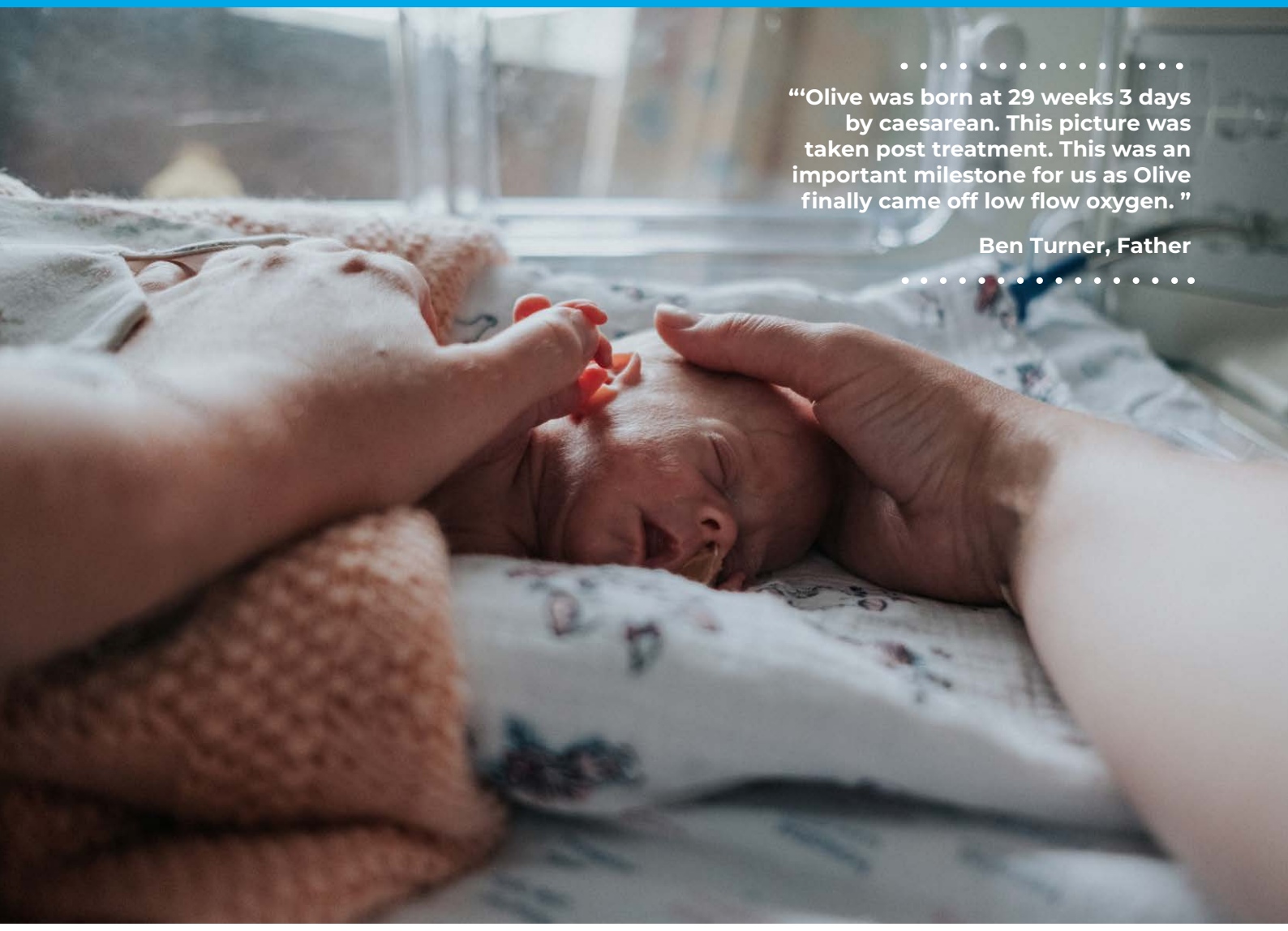
NNAP
National Neonatal Audit Programme

RCPCH Audits

National Neonatal Audit Programme Annual report on 2020 data



HQIP
Healthcare Quality Improvement Partnership

RCPCH
Royal College of Paediatrics and Child Health
Leading the way in Children's Health

NNAP

National Neonatal Audit Programme

National Neonatal Audit Programme (NNAP) Annual report on 2020 data

The National Neonatal Audit Programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the NCAPOP, comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies www.hqip.org.uk/national-programmes.

RCPCH Royal College of Paediatrics and Child Health *Leading the way in Children's Health*

HQIP Healthcare Quality Improvement Partnership

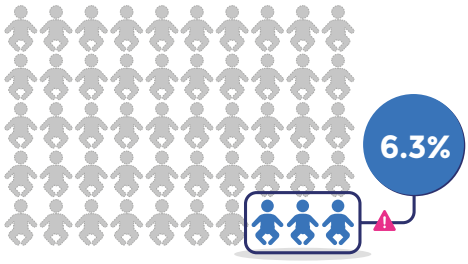
Published by RCPCH March 2022.
The Royal College of Paediatrics and Child Health is a registered charity in England and Wales (1057744) and in Scotland (SCO38299)

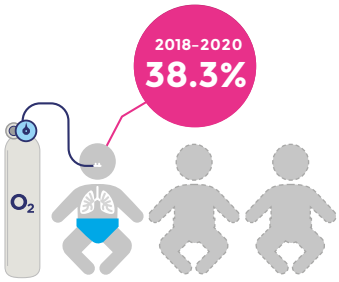
Cite as: National Neonatal Audit Programme (NNAP) Annual report on 2020 data. RCPCH: London, 2022.

At a glance: NNAP 2020 data

Outcomes of neonatal care

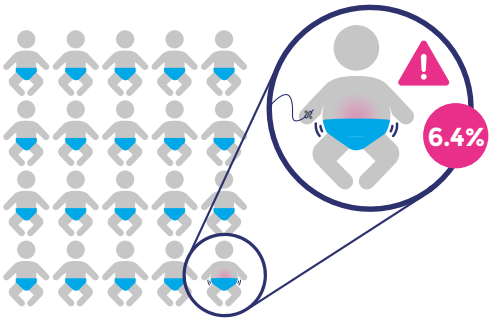
6.3% of babies born at less than 32 weeks' gestation and admitted to neonatal care died before discharge or 44 weeks post menstrual age (July 2018-June 2020). This represents a reduction of 0.3 percentage points since the previous period (July 2017- June 2019), when the proportion was 6.6%.



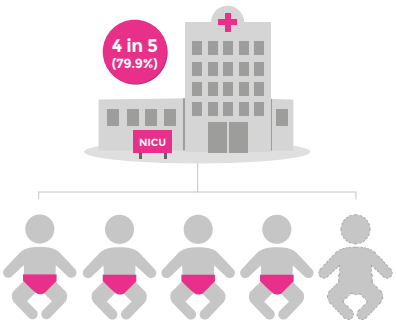


38.3% of babies born at less than 32 weeks' gestation developed significant bronchopulmonary dysplasia (BPD) or died between 2018-2020. This is an increase of 1.7 percentage points compared to the period between 2017 and 2019, the proportion was 36.6%.

6.4% of babies born at less than 32 weeks' gestation developed necrotising enterocolitis (NEC). In 2019, the proportion was 5.5%, however the proportion of units assuring that all their NEC diagnoses have been submitted to the audit has increased since 2019.

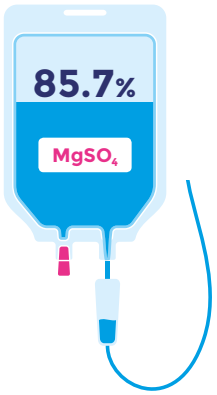


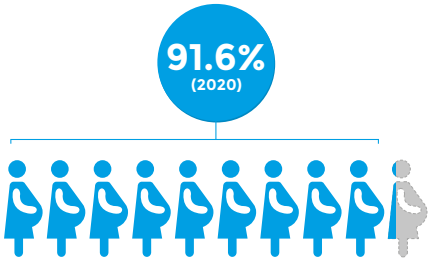
Optimal perinatal care



79.9% of babies (4 in 5) born at less than 27 weeks' gestation were born in a hospital with a neonatal intensive care unit. This represents an increase of 2.4 percentage points since 2019, when the proportion was 77.5%.

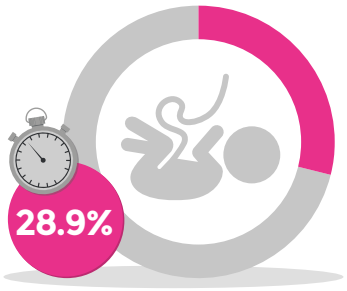
85.7% of mothers of babies born at less than 30 weeks' gestation were given antenatal magnesium sulphate. This represents an increase of 3.6 percentage points since 2019, when the proportion was 82.1%.

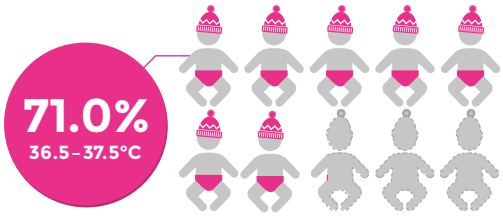




91.6% of mothers of babies born at less than 34 weeks' gestation were given antenatal steroids. This has remained relatively stable since 2019, when the proportion was 91.3%.

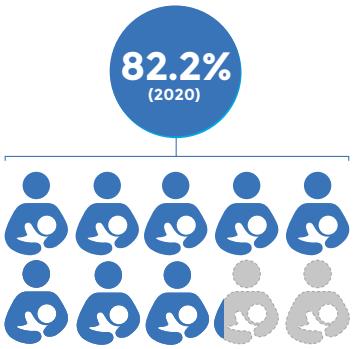
28.9% of babies born at less than 32 weeks' gestation had their cord clamped at or after one minute from birth. This is the first year that deferred cord clamping has been reported in the NNAP.





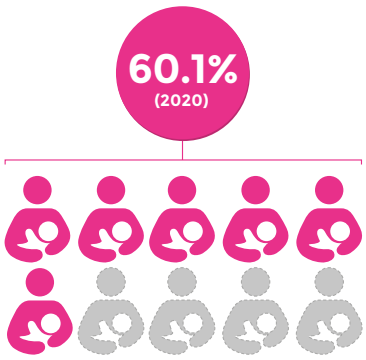
71.0% of babies born at less than 32 weeks' gestation were admitted with a temperature within the recommended range of 36.5-37.5°C. This represents an increase of 1.1 percentage points since 2019, when the proportion was 69.9%.

Maternal breastmilk feeding

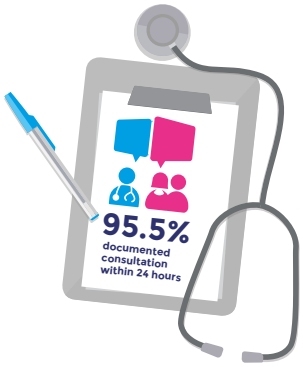


82.2% of eligible babies were receiving mother's milk; either exclusively or with another form of feeding, at 14 days of age. This has remained relatively stable since 2019, when the proportion was 82.4%.

60.1% of eligible babies were receiving mother's milk, either exclusively or with another form of feeding, at discharge from neonatal care. This represents an increase of 1.8 percentage points since 2019, when the proportion was 58.3%.

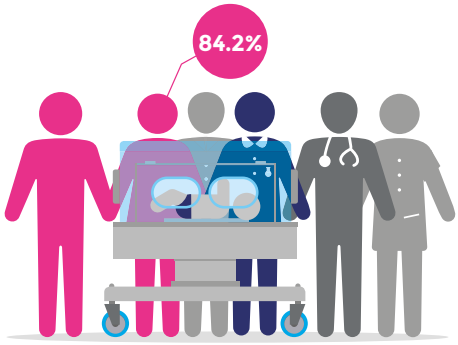


Parental partnership in care

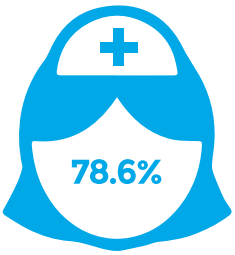


95.5% of parents received documented consultation with a senior member of the neonatal team within 24 hours of their baby's admission. This represents a reduction of 1.2 percentage points since 2019, when the proportion was 96.7%.

In 84.2% of admissions, parents were present on a consultant ward round on at least one occasion during a baby's stay. This represents an increase of 1 percentage point since 2019 when the proportion was 83.2%.



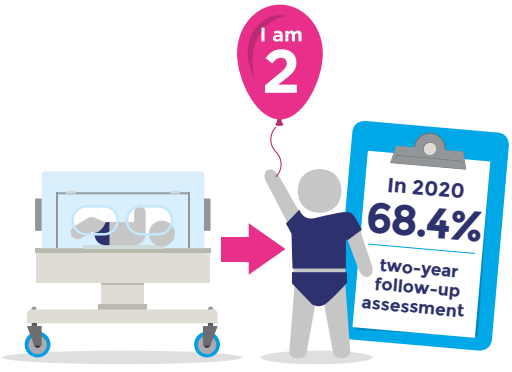
Neonatal nurse staffing



Overall, 78.6% shifts are staffed according to the total nurses' element of the service specification; in 2019, the proportion was 69.0%. 47% of eligible shifts had sufficient staff qualified in specialty (QIS), compared to 44.2% in 2019.

Medical follow-up at two years of age

68.4% of babies born at less than 30 weeks' gestation had a documented medical follow up within the appropriate time period. This represents a reduction of 2.4 percentage points since 2019, when the proportion was 70.8%.



The full NNAP Annual Report on 2020 Data is available at: www.rcpch.ac.uk/nnap. Full results by unit are available on NNAP Online at: https://nnap.rcpch.ac.uk/

Summary of recommendations

Number	Recommendation
1.	**Neonatal units and networks** with high rates of adverse outcomes (bronchopulmonary dysplasia, necrotising enterocolitis and late onset infection) should: · Identify potentially better practices from neonatal units with lower rates of adverse outcomes. · Implement identified best practice, including any identified from the NICE guideline [NG124] Specialist neonatal respiratory care for babies born preterm. *See pages 17 to 21 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*
2.	**Neonatal networks and their constituent neonatal units** should, following a review of local mortality results, the national neonatal Getting It Right First Time (GIRFT) report and the Neonatal Critical Care Review, take action to: · Consider whether changes to network structure, clinical flows, guidelines or staffing might be helpful in reducing local mortality rates. · Consider a quality improvement approach to the delivery of evidence-based strategies in the following areas to reduce mortality: timely antenatal steroids, deferred cord clamping, avoidance of hypothermia and management of respiratory disease. Such quality improvement activity should pay due regard to relevant guidance and resources, such as the NICE guideline for specialist respiratory care and the BAPM and NNAP quality improvement toolkits. · Ensure that shared learning from locally delivered, externally supported, multidisciplinary reviews of deaths (including data from the local use of the Perinatal Mortality Review Tool) informs network governance and unit level clinical practice. *See pages 17 to 21 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*

3.	**Perinatal teams, neonatal units and Local Maternity and Neonatal Systems (in England)** should: · Identify babies who did not receive delivery in the optimal location, antenatal steroids, antenatal magnesium, deferred cord clamping and/or did not achieve post-delivery normothermia, and review records to identify opportunities for improvement. · Adopt evidence-based practices, using the following guidance and methodologies to support improvement: – Maternity and Neonatal Safety Improvement Programme (MatNeoSIP). – BAPM and NNAP quality improvement toolkits, including; Antenatal Optimisation Toolkit, Normothermia Toolkit, and Optimal Cord Management Toolkit. – Prevention of Cerebral Palsy in PreTerm Labour (PReCePT) quality improvement programme. – Preterm Wellbeing Package, Maternity and Children's QI Collaborative, Scottish Patient Safety Programme. – Perinatal Excellence to Reduce Injury in Premature Birth (PERIprem) quality improvement programme. *See pages 22 to 24 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*
4.	**Neonatal units and networks** with low rates of breastmilk feeding at 14 days and/or at discharge should introduce focused quality improvement initiatives in these areas, making use of the following tools and resources: · BAPM and NNAP Maternal Breast Milk Toolkit · UNICEF Neonatal Baby Friendly Initiative · Bliss Baby Charter · Neonatal network Care Coordinators (England). *See pages 25 to 26 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*

5.	**Neonatal units** should look for learning from other units and from adaptations made in response to the COVID-19 pandemic to improve opportunities for parental partnership in care and decision making. This may include: • Using video conference for parental consultation on admission or for attendance on the ward round if it is not possible for parents to attend in person. • Working with local parent groups, parents, staff and other stakeholders to create a culture which actively promotes parent partnership in care, and to manage barriers to change such as concerns about confidentiality and barriers to parents attending the unit. • Ensuring that the service is following the latest guidance on parent and family access to the unit and involvement in care and not inappropriately restricting parents' access to their babies. *See pages 27 to 29 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*
6.	**Neonatal networks** should: • Monitor adherence to recommended nurse staffing standards. • Using findings from Getting It Right First Time (GIRFT) and the Neonatal Critical Care Review, develop action plans to address any deficits in nurse staffing and skill mix. • In England, work with Health Education England to ensure that recommendations from Neonatal Qualified in Specialty Education and Training Review are implemented. *See page 30 for interpretation of results and key messages relating to this recommendation. See Appendix A and NNAP Online for full results.*

Key actions for the NNAP in the following year:

Number	Recommendation
1.	To increase the utility of outcomes reporting **the NNAP** should: • Seek to achieve assurance from 100% of neonatal services that their outcomes data (necrotising enterocolitis, late onset infection and mortality, and the forthcoming measure of preterm brain injury) are complete and accurate. • Consider case mix adjustment of necrotising enterocolitis, late onset infection and the forthcoming NNAP measure of preterm brain injury as data quality improves. *See pages 17 to 21 for interpretation of results and key messages relating to this action. See Appendix A and NNAP Online for full results.*
2.	**The NNAP**, in collaboration with appropriate partners such as the National Child Mortality Database (NCMD), should consider whether the observed variation in neonatal unit mortality can be explained by varied implementation of optimal care processes and structures, or if alternative explanations should be sought. *See pages 17 to 21 for interpretation of results and key messages relating to this action. See Appendix A and NNAP Online for full results.*
3.	**The NNAP** should continue to explore ways of presenting data on optimal perinatal care to best support quality improvement, by: • Working with partners such as the National Maternity and Perinatal Audit (NMPA) to align reporting of key metrics with the Maternity and Neonatal Safety Improvement Programme (MatNeoSIP) in England. • Considering reporting the proportion of eligible babies receiving all relevant perinatal interventions. *See pages 22 to 24 for interpretation of results and key messages relating to this action. See Appendix A and NNAP Online for full results.*

4.	Based on the information in this and previous NNAP reports, we would like to encourage: · The **Office for Health Improvement and Disparities in England** (formerly Public Health England) and **Public Health Wales** to consider the introduction of a public health messaging programme around the importance of breastmilk feeding that is targeted to specific communities with the aim of reducing geographical inequity in rates of breastmilk feeding so that preterm babies may benefit. The RCPCH-hosted National Neonatal Programme Board, with the support of the RCPCH and the NNAP, will aim to start a discussion with the commissioner and funders of the NNAP to agree the best way to progress this. *See pages 25 to 26 for interpretation of results and key messages relating to this action. See Appendix A and NNAP Online for full results.*
5.	Based on the information in this and previous NNAP reports, we would like to encourage: · If the rate of delivery of medical follow-up at two years does not improve over the next twelve months, **national specialist and local commissioners in England and Wales** to consider introducing incentives for Trusts and Health Boards to meet the requirements of the NICE guidance Developmental follow-up of children and young people born preterm, to make it more likely that this important review is conducted. The RCPCH-hosted National Neonatal Programme Board, with the support of the RCPCH and the NNAP, will aim to start a discussion with the commissioner and funders of the NNAP to agree the best way to progress this. *See pages 31 to 32 for interpretation of results and key messages relating to this action. See Appendix A and NNAP Online for full results.*

Acknowledgments

The NNAP Project Board would like to thank all the NHS doctors, nurses, administrators, data analysts, clinical audit department staff and others who have given their time and effort to collect information for the audit, ensure its accuracy and act upon their results, despite incredibly challenging circumstances. In particular, thanks go to the NNAP clinical leads in each unit, and the neonatal networks for their continued support.

Our thanks also go to the Neonatal Data Analysis Unit (NDAU) at Imperial College, who until March 2021 worked with the RCPCH over many years to deliver data management, analytical and statistical services for the NNAP.

With thanks to Dr Jim Gray, Consultant Microbiologist at Birmingham Women's and Children's NHS Foundation Trust, who kindly reviewed blood culture organisms and helped classify them into 'clearly pathogenic' and 'other' organisms.

We would like to thank the parents of babies whose data makes up this report for their important contribution to ongoing improvements in neonatal care, and offer a special thank you to all the families who kindly shared their photographs and experiences of neonatal care, some of which are included in this report. Finally, we would like to thank all staff whose dedication to high quality data entry, management and validation allows this report to be published.

Full Project Team, Project Board and Methodology and Dataset Group membership is listed in Appendix A.

Table of contents

1. Introduction

Established in 2006, the National Neonatal Audit Programme (NNAP) is a national clinical audit of care for babies admitted to neonatal services. Approximately 1 in 7 babies will require neonatal care because they are born too early, have too low a birth weight or have a medical condition that needs specialist treatment. The audit reports on key measures of the processes and outcomes of neonatal care and supports professionals, families and commissioners to improve the care provided to babies requiring specialist treatment. To do this, the audit collects and processes patient data to assess the care given to babies admitted to neonatal units. It uses this information to highlight areas where services are performing well, and to identify areas where they need to improve.

The NNAP's overarching quality improvement objectives are to:

- reduce unit and network level variation through benchmarking, outlier identification and management, sharing best practice and quality improvement (QI) examples, and signposting to resources available in the wider neonatal care system
- nationally, to seek to reach agreed developmental standards for process measures where care currently falls below those standards
- report outcome measures and their variation between units and networks
- collaborate with other audits to improve neonatal care
- adapt to new and emerging quality improvement priorities.

The NNAP is delivered by the Royal College of Paediatrics and Child Health (RCPCH), commissioned by the Healthcare Quality Improvement Partnership (HQIP) and funded by NHS England and the Welsh Government.

This report includes data from neonatal services in England and Wales. Until March 2021, the NNAP also audited Scottish neonatal services. Currently the contract to deliver the audit does not cover Scotland, however the intention is to audit Scottish services again once governance and contractual arrangements allow. Comparisons made to previous year's results include the results from all nations participating in the audit in those years.

The NNAP is operating under a new data flow methodology, and this is the first report which uses data received directly by the RCPCH for the purpose of the NNAP under that methodology. Due to the implementation of the new data flow, the need to recreate the analysis from earlier years produced via the previous data flow and the application of the National Data Opt-out Message Exchange for Social Care and Health (MESH) to remove data about patients who have opted out of secondary use of their data, there are extremely minor differences in this report with the provisional results provided to neonatal units in March 2021 as part of the data cleaning and validation process.

This report presents key themes and conclusions arising from analysis of the 2020 audit data. The NNAP brings together a multidisciplinary group, including parents, to identify key messages and translate them into a set of recommendations that can be acted upon to improve neonatal care. Key messages and recommendations are made under the themes: outcomes of neonatal care, optimal perinatal care, maternal breastmilk feeding, parental partnership in care, neonatal nurse staffing, and care processes.

Recommendations are made to support the existing goals and priorities of neonatal and perinatal services and are targeted to the audience with the ability to action the recommendation. Full results and methodology can be found in Appendix A: Results and Methods, NNAP Annual Report on 2020 data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Previous NNAP reports can be downloaded from: www.rcpch.ac.uk/nnap

2. Interpretation of results and key messages

The COVID-19 Pandemic

This report describes neonatal care in a period when societal lockdowns, limitations to parental access, staff shortages and general disruption to hospital services had the potential to significantly impact care delivery, and overall had a negative impact on families' experience of it. In general, our impression is that the quality of perinatal and neonatal care reported here during 2020 was very well maintained, and in some cases improved despite the pandemic. Different services and networks may have been affected differently by COVID-19. As audit users interpret their own data they should consider whether COVID-19 was relevant to their results and whether their response to the data needs to be one of seeking mitigations in the event of future comparable disruption to healthcare or whether their best practice in COVID-19 times could be helpfully shared. We have made direct comment in this report wherever it seems likely that the delivery of care was affected by COVID-19.

"Marilynn was born at 37 weeks. Due to COVID, we had to wear masks, but we could go to see her at any time. This was really good as we were struggling a lot".

Jade, Mother

2.1. Outcomes of neonatal care

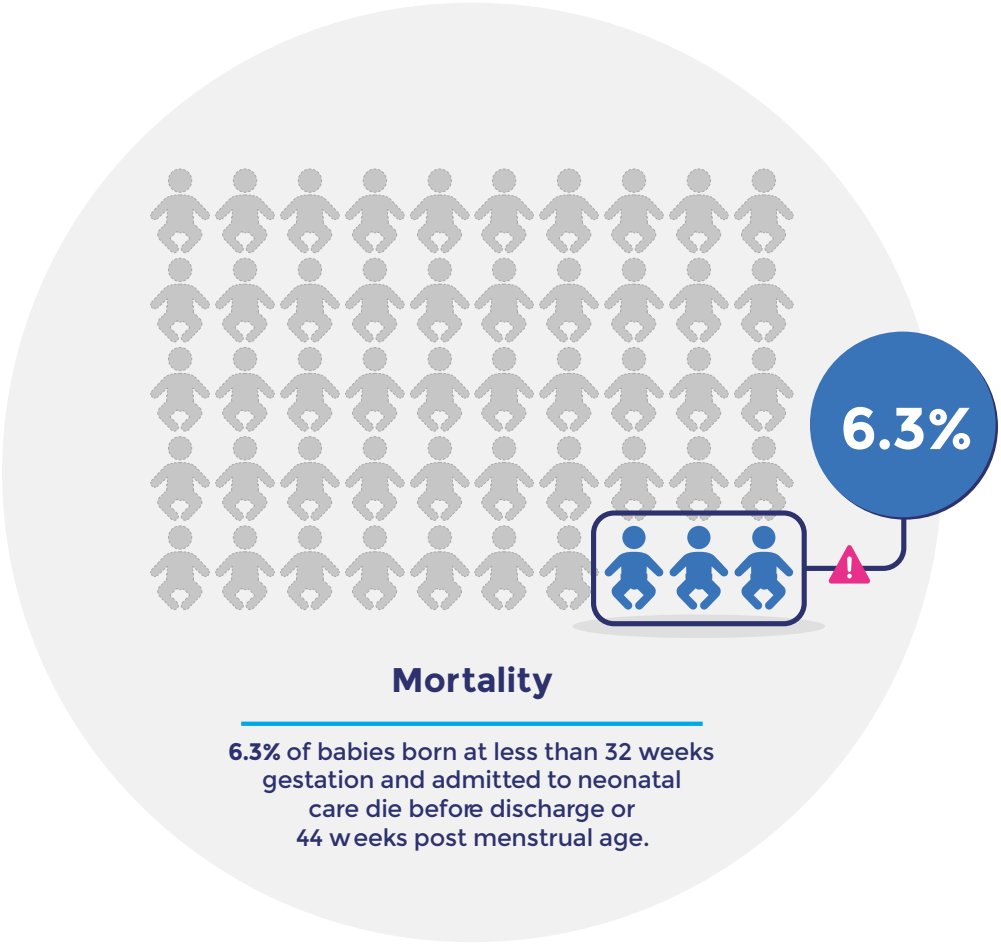
The overarching aim of neonatal care is to deliver high quality evidence-based care for babies needing additional hospital care after birth, in order to maximise chances of survival and positive long-term outcomes. The NNAP seeks to reduce the proportion of babies dying or experiencing serious complications of prematurity. The NNAP reports the following important outcomes of neonatal care: Mortality until discharge in very preterm babies, Bronchopulmonary dysplasia (or death), Necrotising enterocolitis and Late onset infection.

"Theo was born at 26 weeks and spent 5 months in a NICU due to severe chronic lung disease. We all tried to make every day magical for him and this picture shows the love and special bond between him and his Dad. You can also see the special heart tube sticker made for him by the nurses."

Hayley, Mother

Interpretation of results

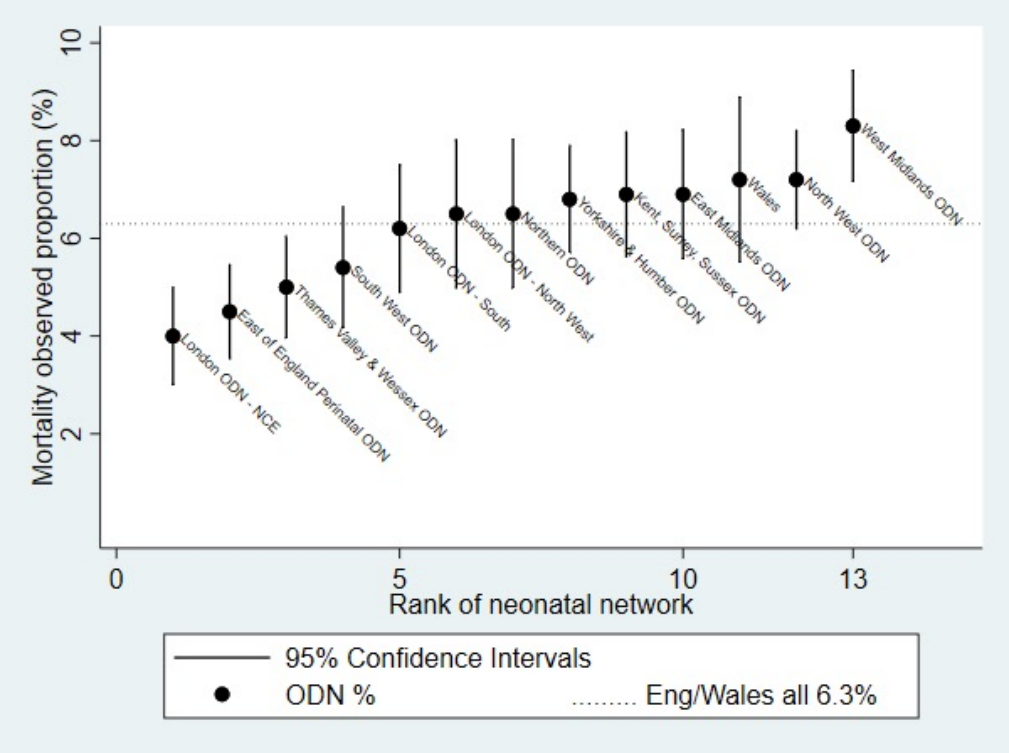
Mortality until discharge from neonatal care

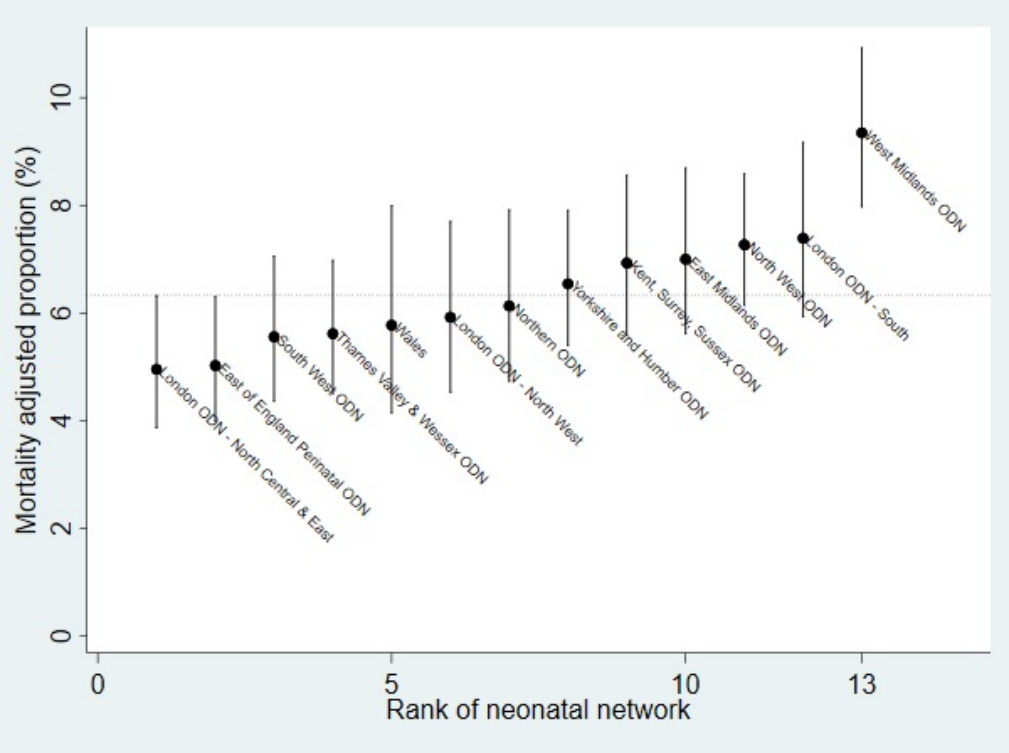


- Striking variation in observed mortality until discharge home from neonatal care (or 44 weeks post-menstrual age) in babies born at less than 32 weeks persists between networks (4% to 8.3% - see Figure 1- top), however survival between July 2018 – June 2020 was slightly improved compared to the previous epoch (0.3 percentage points between July 2017 – June 2019). Mortality until discharge in babies born at less than 28 weeks gestational age ranges from 7.9% to 19.8% (see Appendix A). There is a gap in knowledge about what is driving rates of mortality.
- Adjustment for background variables does not fully explain variation in mortality between neonatal networks. Adjusted mortality ranges from 5.0% to 9.3% between neonatal networks (Figure 1 – bottom), increasing to 11.4% to 22.7% when looking at adjusted mortality in babies born at less than 28 weeks gestational age only (Appendix A).

Figure 1. Caterpillar plot of observed proportion of mortality until discharge in babies born at less than 32 weeks (TOP) and adjusted proportion of mortality until discharge (BOTTOM): neonatal network or operational delivery network (ODN).

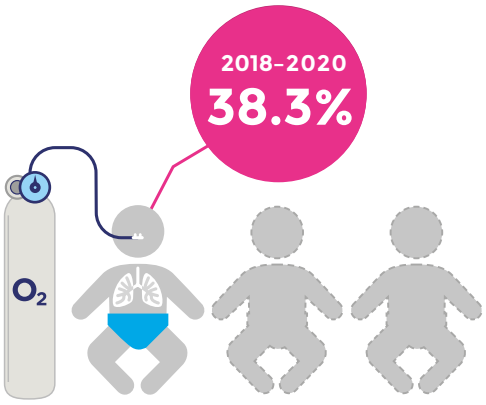
Network proportions are presented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot.





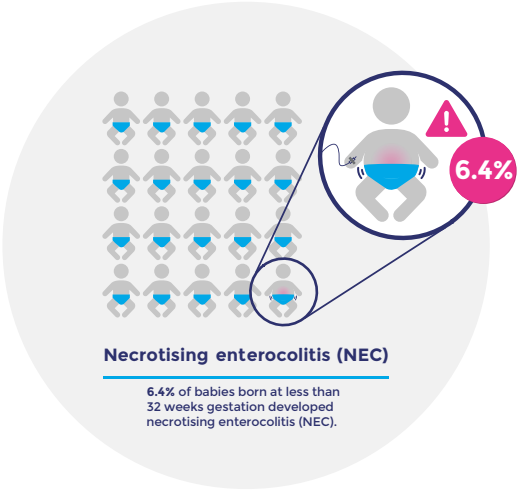
Bronchopulmonary dysplasia (BPD)

- Proportions of babies who developed BPD or died vary significantly by network (33.4% to 44.3%), and by unit of birth. This likely represents unwarranted variation and an opportunity to change care processes to improve outcomes.
- Accounting for background variables does not fully explain differences in the proportions of babies who developed BPD or died between networks; adjusted proportions of BPD or death range from 32.7% to 43%.



Necrotising enterocolitis (NEC)

- The proportion of babies with NEC appears slightly higher (2020 - 6.0%; 2019 - 5.0%) among the 87% of units who have reported validating their 2020 data. This may reflect either increased ascertainment with increased validation activity (in 2019, 64% of units validated data) or an underlying change in NEC incidence. Rates of NEC vary widely between neonatal networks, from 3.5% to 10.0%; it should be noted that no case mix adjustment method is applied to this data.



Late onset infection

- A higher proportion of neonatal units than in previous years (2020 - 84%; 2019 - 63%) confirmed that every positive blood culture was entered into BadgerNet. Units confirming complete data entry reported slightly higher proportions of bloodstream infection (5.9% vs 5.8%) in babies born at less than 32 weeks' gestation), which underlines the importance of complete data entry for useful comparisons between units.
- There is only a weak correlation between bloodstream infection and central line associated bloodstream infection (CLABSI). While proportions of CLABSI are potentially explanatory for proportions of bloodstream infection, it is evident that reducing infection depends on more than simply minimising CLABSI.
- 5.8% of babies born at less than 32 weeks experienced one or more late onset bloodstream infections with a clearly pathogenic organism. This figure was 0.2% for babies born at or above 32 weeks. There is important variation between units in the proportion of babies experiencing bloodstream infection – for example the proportion of bloodstream infection with a clearly pathogenic organism in neonatal intensive care units (NICUs) varies from 0% to 14.5%.

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key messages

Adverse outcomes (BPD, NEC and infection) vary importantly across neonatal units and networks. For example, the proportion of babies with BPD varies by 11 percentage points between neonatal networks. Adjustment for background variables does not account for geographical variation in rates of bronchopulmonary dysplasia. This likely represents unwarranted variation and an opportunity to change care to improve outcomes.

Mortality in very preterm babies varies substantially (from one in 25 babies to one in 12 across neonatal networks) depending on where they are cared for, even when baseline risks are taken into account. This is unexplained.

2.2. Optimal perinatal care

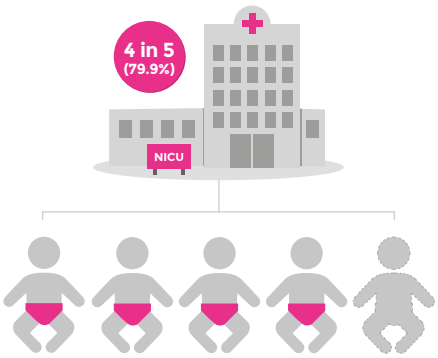
Providing the right care just before and after birth is essential to improving outcomes for babies requiring neonatal admission. The NNAP aims to increase the proportion of babies receiving all key evidence-based perinatal care interventions as identified by the Maternity and Neonatal Safety Improvement Programme (MatNeoSIP)[1]. The NNAP reports on a number of these interventions; birth in the right place, antenatal steroids, magnesium sulphate, deferred cord clamping and admission temperature.

"This is my husband touching our baby girl for the first time. He felt so left out of the pregnancy because he was not allowed to come to any appointments due to COVID. Also, given that she was so early, he had never felt her move inside me. I was unable to go to the NICU with Ellie, but he set straight into daddy mode the second he laid eyes on her and has been in love ever since!"

Samantha, Mother

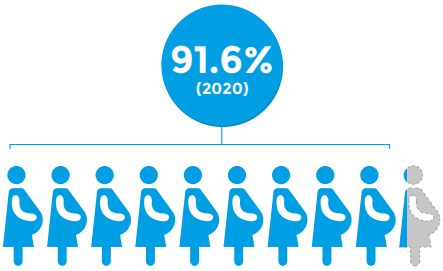
Interpretation of results

Birth in a centre with a neonatal intensive care unit (NICU)



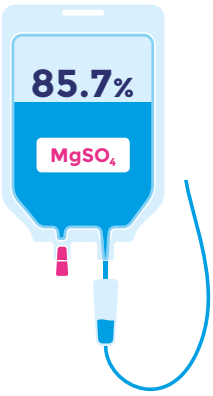
- Overall, 79.9% (1,115/1,395) of babies born at less than 27 weeks were born in a maternity service on the same site as a designated NICU. There has been a steady improvement in this measure since its introduction (2018 – 74.3%, 2019 – 77.5%), which represents significant progress towards the NNAP developmental standard of 85%.
- Across neonatal networks, the proportion ranges from 72.2% (Yorkshire and Humber ODN) to 86.5% (Kent, Surrey and Sussex ODN, and North West ODN). Three networks meet the NNAP developmental standard.
- One low performing network in 2019 – East of England Perinatal ODN – has made significant progress towards the developmental standard (an increase of 12.6 percentage points), but importantly all low performing units in 2019 have improved.

Antenatal steroids



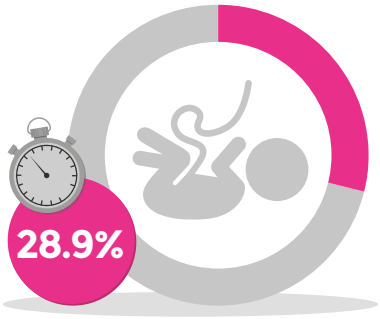
- 91.6% (9,248/10,091) of eligible women whose baby was born at 23 to 33 weeks' gestation received at least one dose of antenatal steroids, exceeding the NNAP developmental standard of 85%. In 2019, the proportion receiving antenatal steroids was 91.3%.
- Among neonatal networks, the proportion of women receiving at least one dose of antenatal steroids ranged from 89.2% (Kent, Surrey and Sussex ODN) to 93.1% (London ODN – South). All networks have met the NNAP developmental standard, however, the difference between antenatal steroid administration in the network with the highest and lowest proportions is sufficient that it would be expected to have affected outcomes for some babies. The variation between networks has persisted since throughout NNAP reporting of this metric.

Antenatal magnesium sulphate



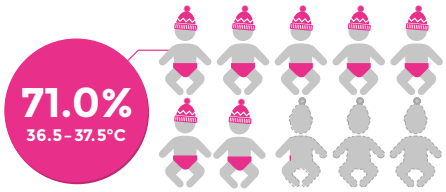
- 85.7% (2,902/3,386) of eligible women received antenatal magnesium sulphate before delivering their baby at less than 30 weeks' gestational age. Administration of magnesium sulphate has increased from 53.3% when the measure was first introduced in 2016 and meets the NNAP developmental standard of 85% for the first time. This rapid improvement, particularly seen in England, is likely to result from the targeted approach of the PReCePT quality improvement initiative. Across networks, magnesium sulphate administration ranges from 75.3% (Wales) to 91.0% (Thames Valley and Wessex ODN). Eight networks exceed the NNAP developmental standard of 85%, suggesting that rates of administration approaching 90% are achievable.

Deferred cord clamping



- The NNAP reports deferred cord clamping for the first time this year. Proportions of missing data are significant, 20.1% (1,361/6,783) of eligible babies did not have a time of cord clamping recorded. Missing data varied from 0% to more than 60% in units of all types. Of the eligible babies with a time of cord clamping entered, the proportion having deferred cord clamping (at 1 minute or more) was 28.9% (1,568/5,422).
- Among neonatal networks, missing data ranged from 42.5% (Northern ODN) to 12.0% (Thames Valley Wessex ODN). Among networks, the proportion of babies having deferred cord clamping ranged from 60.6% (South West ODN) to 7.3% (London - North Central and East ODN).

Normal temperature on admission



- Overall, 71.0% (4,617/6,501) of admitted babies born at less than 32 weeks had a normal first temperature on admission, taken within an hour of birth. In 2019, the proportion was 69.9%, having increased from 52.1% when the measure was first introduced in 2013. In 2020, 11.3% of babies had a first measured temperature above 37.5°C, and 14.7% of babies had a first measured temperature below 36.5°C. There is little evidence that interventions to achieve normal temperature have increased rates of babies with a temperature above 37.5°C.
- Among neonatal networks, the proportion of babies with normothermia on admission ranged from 62.0% (Northern ODN) to 82.0% (Thames Valley and Wessex ODN).

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key messages

Despite the significant impact of COVID-19 on aspects of healthcare delivery in the period after March 2020, neonatal services have achieved high, and improved, rates of perinatal health promoting strategies such as antenatal steroid administration, antenatal magnesium sulphate administration, normal temperature on admission and birth of extremely preterm babies in a centre with a neonatal intensive care unit. However, variation persists between neonatal units and networks, demonstrating opportunity for further improvement.

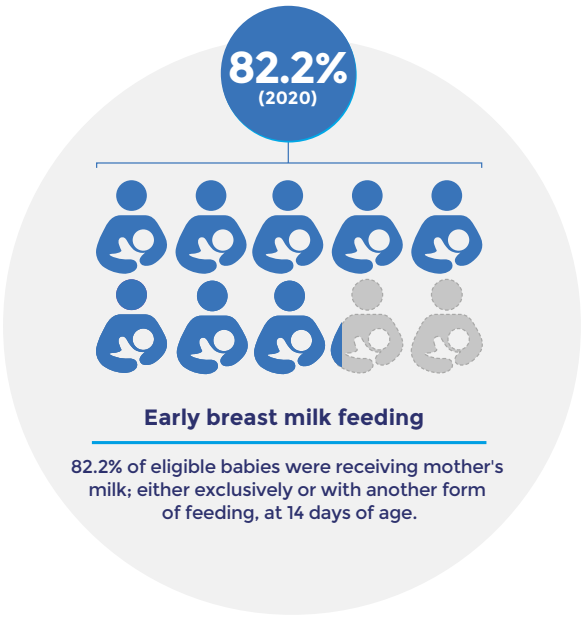
Deferred cord clamping is an important intervention known to reduce mortality in babies born preterm. Implementation of deferred cord clamping varies greatly between neonatal units and networks – ranging from 7.3% to 60.6% among networks. Implementation also varies by type of neonatal unit, with higher levels of deferred cord clamping in neonatal intensive care units. This is the first year of reporting this audit measure in the NNAP and rates of missing data are significant as well as data varying greatly between services.

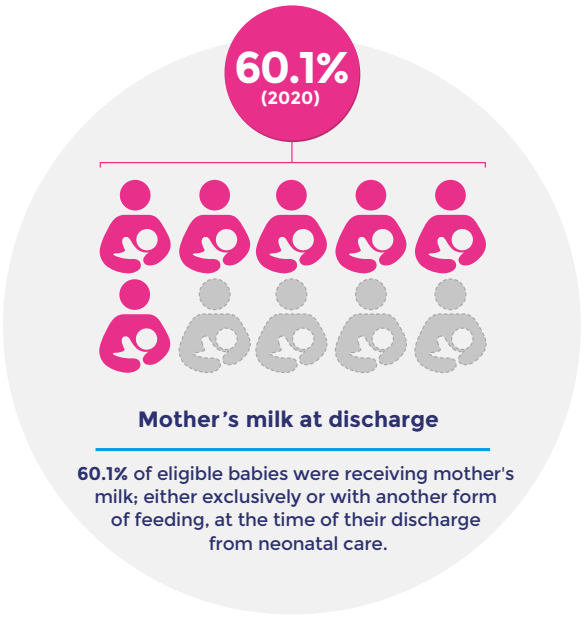
2.3. Maternal breastmilk feeding

Breastmilk feeding has health benefits for both baby and mother. During neonatal care, breastmilk protects against necrotising enterocolitis and infection. Breastfeeding also helps to build the relationship between the mother and baby. Establishing and maintaining breastmilk feeding can be difficult, particularly with the additional challenges faced by families whose babies require neonatal care. It is important that adequate support, understanding and information is available to support those who can, and want to, breastfeed. The NNAP reports rates of early breastmilk feeding at 14 days of life and at discharge from the neonatal unit.

"This photo shows Charlie with his feeding tube at just under a month old. Charlie tolerated the tube well most of the time. This picture is important to us because it proudly shows off his beautiful cleft smile while he has his feeding tube in place."
Kim, Mother

Interpretation of results





- The proportion of babies receiving any of their mother's own milk at 14 days of life is 82.2% (5,273/6,416); in 2019 the proportion was 82.4%. This compares very favourably to babies who do not receive specialist neonatal care. The proportion of babies receiving any of their mother's own milk at discharge from neonatal care is 60.1% (3,514/5,844); in 2019 the proportion was 58.3%. No decrease was seen during 2020, despite the COVID-19 pandemic.
- Prevalence of breastmilk feeding at discharge varies more widely between neonatal networks than prevalence of early breastmilk feeding. At 14 days of life, the proportion ranges from 75.4% (East Midlands ODN) to 89.3% (London – North West). At discharge, the proportion ranges from 48% (Northern ODN) to 75.8% (London ODN – South).

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key message

There has been no significant change in of the proportion of babies receiving breast milk, either at 14 days of age or at discharge from neonatal care in recent years. However, nationally, rates of breastmilk feeding appear to have been maintained despite the COVID-19 pandemic. Low rates of breastmilk feeding, variation by geography in use of breastmilk, and variation within unit types has persisted over time.

2.4. Parental partnership in care

Neonatal care is very stressful for babies and parents, and it is important that families understand and can be fully involved in the care of their baby. The NNAP measures focus on ensuring that parents have an early opportunity to meet with the senior staff member caring for their baby, and that they are partners in care planning through involvement in consultant ward rounds.

Babies admitted to some neonatal units may be separated from their mothers for longer than comparable babies admitted to other neonatal units. Such separation may be minimised by caring for some babies in a transitional care unit, where mother and baby can be cared for together. The NNAP reports a measure of separation days for babies receiving low dependency care where no breathing support was needed.

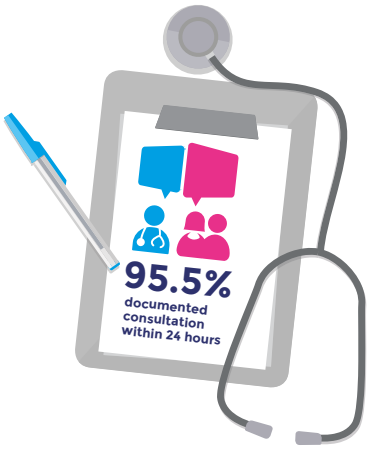
Neonatal care reflected in this report was delivered in a period when the COVID-19 pandemic was severely impacting hospital care. Unfortunately, despite the campaign to raise awareness that parents are partners in care, rather than visitors, parental access to their babies was often restricted in ways beyond the control of the neonatal care team. This report should be interpreted with this perspective in mind.

"This is me having a double cuddle with my babies, during the daily ward round carried out by the doctors. The doctors always made sure they spoke to me about both babies, their progress, and what would happen next. This made me feel very reassured and relaxed, knowing that both our babies were getting the best care. During these double cuddles, doctors would often check the babies e.g., head circumference and general wellbeing".

Yasmin, Mother

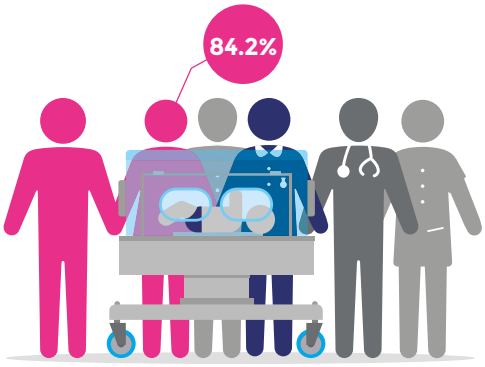
Interpretation of results

Parental consultation within 24 hours of admission



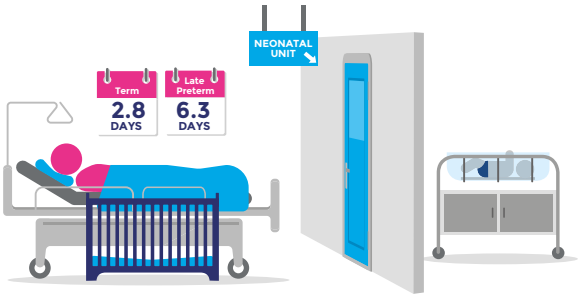
- Parents had a consultation with a senior member of the neonatal team within 24 hours of their baby's admission in 95.5% (50,576/52,979) of episodes. Across neonatal networks, the proportion ranges from 91.9% (East Midlands ODN) to 98.7% (Thames Valley and Wessex ODN).
- Achievement of first consultation within 24 hours of admission has reduced by 1.2 percentage points compared to 2019.

Parental presence at consultant ward rounds



- Overall, parents attended a ward round at least once in their baby's stay in 84.2% of admissions (45,637/54,206). The proportion increases with length of stay as longer stays make both attendance and its recording more likely.
- This measure of parental attendance at ward rounds has increased by 1 percentage point since 2019, compared to yearly increases of 4-5 percentage points between 2017 and 2019.

Minimising separation of mother and baby



- On average, there continues to be small year on year reductions in the length of stay of both moderate and late preterm babies as well as those born at term. This suggests that modifications in practice and structures of care can reduce mother and baby separation. It is unlikely that separation days for babies included in this measure could be reduced to zero.
- The variation between the mean number of separation days by network (5.3 - 7.8 for late and moderate preterm; 2.4-3.3 for term babies) and by unit (1.7 - 12.2 for moderate and late preterm babies; 1.1 - 5.5 for term babies) likely reflects variations in practice and facilities. However, duration of stays in the neonatal unit should be examined alongside underlying rates of admission to the neonatal unit for moderate to late preterm, as well as term babies.

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key message

Restrictions on parents' access to the neonatal unit imposed in response to the COVID-19 pandemic from March 2020 onwards may have impacted on parental consultation within 24 hours of admission and parent's attendance on ward rounds. The rate of parental consultation has reduced by 1.2 percentage points compared to 2019, and the rate of improvement in parent's attendance on ward rounds has slowed. However, variation in performance varies widely between neonatal units, and some units have been able to maintain high performance in these measures.

2.5. Neonatal nurse staffing

Neonatal units in England are commissioned according to the NHS England service specification for Neonatal Critical Care[2]. Services in Wales are commissioned on a comparable basis according to the British Association of Perinatal Medicine (BAPM) standards[3]. Higher nurse staffing levels are associated with improved outcomes[4]. The NNAP looks at the proportion of shifts staffed according to the specification, and the number of additional nurse shifts required to meet the specification.

This is a photo of the amazing staff who became family when our baby Oscar arrived as a big surprise at 27 weeks.'

Terri, Mother

Interpretation of results

- Overall, 78.6% (89,775/114,178) of shifts are staffed according to the total nurse's element of the service specification. This is an increase on 2019 when 69% were staffed to specification.
- 47.2% (37,425/79,279) of eligible shifts have sufficient staff qualified specialty (QIS). Again, this represents an increase compared to 2019 when 44% of shifts had sufficient QIS staff.
- Networks range in adherence to both elements of the service specification; from 67.1% to 86.9% for the total nurse's element and 23.5% to 77.1% for the QIS element.

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key message

Compliance with nurse staffing ratios set out in the service specification for neonatal critical care is improving, both in terms of the total nurse's element and the qualified in specialty (QIS) element of the specification. However, neonatal networks vary widely in the proportion of shifts staffed according to specification and fall far short of full compliance in both elements. Given the clear link between higher nurse staffing ratios and improved outcomes, nurse staffing remains a serious challenge for neonatal services.

2.6. Care processes

Babies born very early or with a very low birth weight are at risk of retinopathy of prematurity (ROP). This condition affects the development of the blood vessels in the back of the eye. ROP can lead to loss of vision, but this is usually prevented by timely treatment. Therefore, screening babies for ROP at the right time is important to help babies have the best vision in the future.

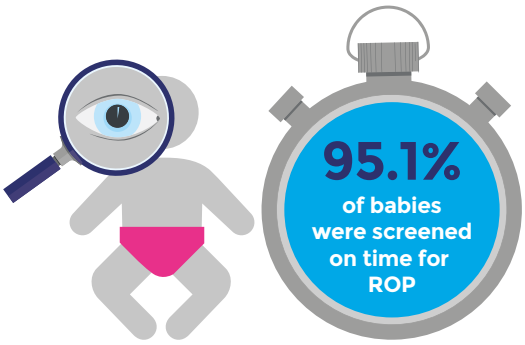
It is important that the development of very preterm babies is monitored after the baby is discharged from the neonatal unit. We look at whether there is a documented medical follow-up consultation at two years of age for babies born at less than 30 weeks' gestational age between July 2017 and June 2018 who survived and were discharged home from the neonatal unit.

LEFT: *"Skin to skin cuddles on the unit. This is my favourite picture from the neonatal intensive care unit and is enlarged and framed in my home. It is so special, showing how small Archie was still despite being weeks old, his shiny blonde hair and the content look on his face while having skin to skin".* RIGHT: *"Archie aged two. Mighty oaks from little acorns grow".*

Amy, Mother

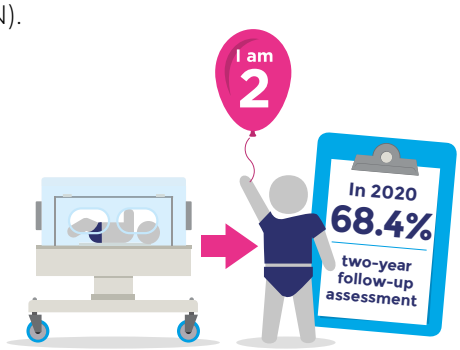
Interpretation of results

On time screening of retinopathy of prematurity



- 95.1% (7,010/7,368) of eligible babies were screened on time for ROP. In 2019, 95.7% of babies were screened on time. 240 (3.3%) babies were screened early or late, and 118 babies (1.6%) received no screen. 73 of the 321 babies screened late or not at all were less than 30 weeks' gestation and had a birthweight of less than 1,000g – meaning they were at high risk of sight threatening disease.
- Across neonatal networks, the proportion of on time screening ranged from 86.7% (Northern ODN) to 97.6% (Yorkshire and Humber ODN).

Follow-up at two years of age



- 68.4% (2,571/3,760) of eligible babies had a documented medical follow-up within the appropriate time period. In 2019, the proportion receiving follow up was 71%. The COVID-19 pandemic may have impacted upon the delivery of neonatal developmental follow up.
- Across neonatal networks, the proportion ranges from 51.1% (London ODN – South) to 84.6% (East Midlands ODN), indicating a wide geographical variation in achievement of documented medical follow-up. Neonatal units of all types vary from delivering no, or very low rates of follow-up, to seeing 100% of eligible babies.

Full results by neonatal unit type and network can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data. Full unit level results are available on NNAP Online at: www.nnap.rcpch.ac.uk

Key message

The rate of improvement in the delivery of medical follow-up at two years of age has been slow, with a reduction seen in 2020 which may be due to the impact of the COVID-19 pandemic. Wide geographical variation remains in its delivery.

2.7. Overall network performance

Spine plots on the following page give an overview of overall network performance across all measures and support the management of quality improvement priorities.

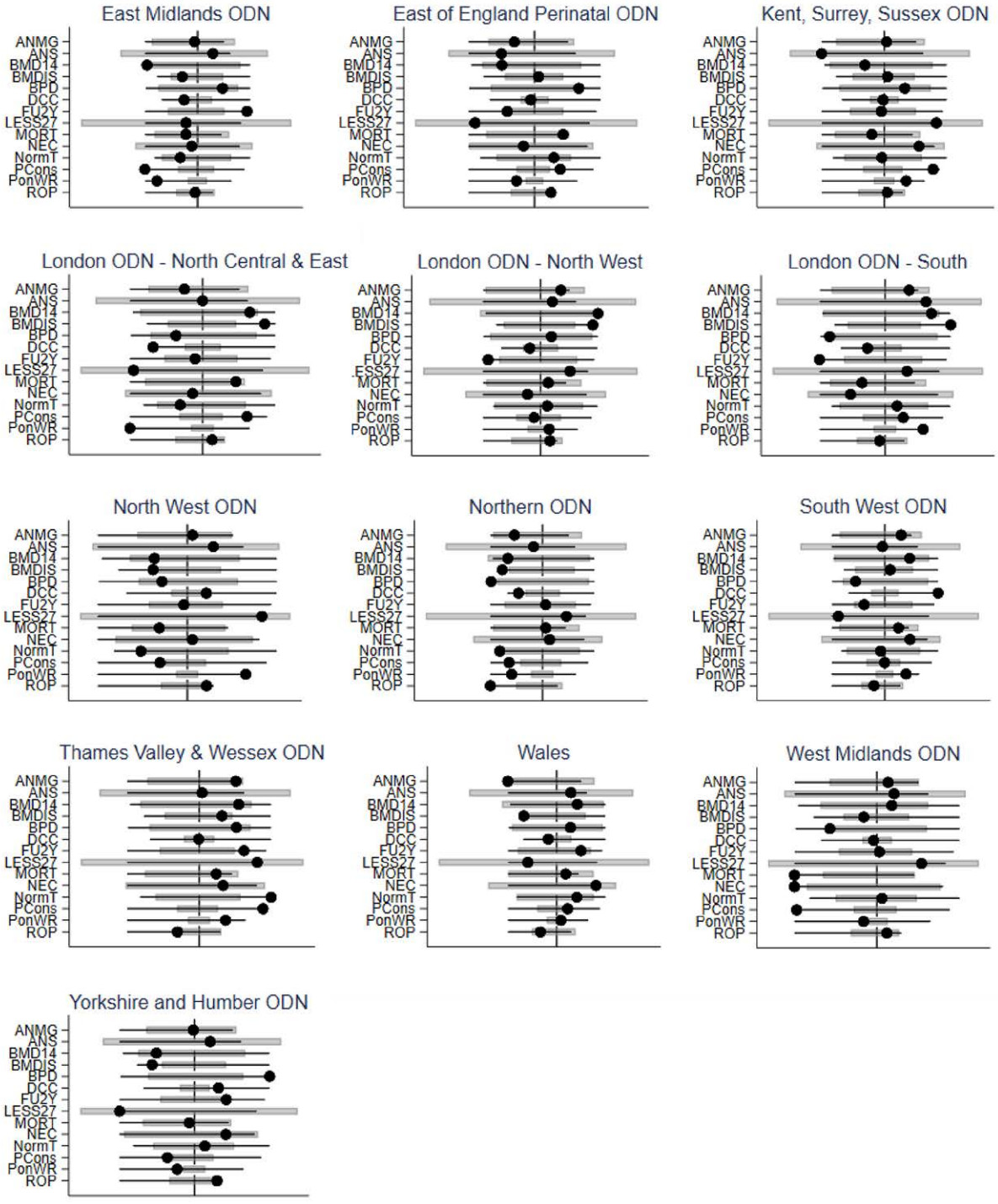
Each network is presented as a panel alongside other networks. Performance on each measure is shown with a black disk positioned on a horizontal line for each measure. The line extends from the lowest to the highest value for that measure among all networks.

The rates are scaled so the national rates are aligned to a single vertical line for all measures and orientated so that better performance is to the right-hand side. A grey bar describes the expected range - two standard deviations either side of the national rate, akin to a funnel plot.

The measures of "BPD or death" and mortality are represented by adjusted proportions. Unit level plots can be seen on NNAP Online: www.nnap.rcpch.ac.uk.

Key to measure abbreviations:

ANMG	Antenatal magnesium sulphate
ANS	Antenatal steroids
BMD14	Breastmilk feeding at 14 days of life
BMDIS	Breastmilk feeding at discharge home
DCC	Deferred cord clamping
FU2Y	Follow-up at two years of age
LESS27	Birth at a centre with a NICU at less than 27 weeks' gestation
MORT	Mortality until discharge from neonatal care
NEC	Necrotising enterocolitis
NormT	Normal temperature on admission
PCons	Parental consultation within 24 hours of admission
PonWR	Parent presence on consultant ward round
ROP	Screening for retinopathy of prematurity (ROP)



3. Using NNAP data: Local quality improvement case studies

3.1. Optimising early maternal breastmilk for preterm infants

C. White, P. Colwell, M. Hutchison-Saxon, A. O' Doherty, K. Eaton, R. Gottstein, K. Munthali, N. Edi-Osagie and K. Tanney – Newborn Intensive Care Unit, Saint Mary's Hospital, Manchester University NHS Foundation Trust (MFT).

Background

The quality improvement (QI) project started in December 2020 with establishing a multidisciplinary working group of staff across the St Mary's Hospital Managed Clinical Service (MCS) inclusive of representatives from the neonatal units, maternity and postnatal wards. Focus was placed on the following challenges:

- Named equipment checker for both newborn services and maternity
- Education for parents and staff
- Enhancing parental involvement in this initiative

In the North West of England, achieving high rates of breastmilk provision has been challenging, with St Mary's Hospital's NNAP results as below:

- 2018: 47% babies <33/40 receiving mother's own milk at discharge (national rate 60%)
- 2019: 43% babies <33/40 receiving mother's own milk at discharge (national rate 58%)
- 2020: 61.5% babies <32/40 receiving mother's own milk at discharge (national rate 60%)
- 2020: 76.6% babies <32/40 receiving mother's own milk at 14 days old (national rate 82%)

In response to serially disappointing results, the key focus of the QI project was supporting the implementation of the five Perinatal Core Elements to optimise early mother's breastmilk for preterm babies (BAPM 2020).

In the NICU, these two elements were concentrated on:

- Initiation of expressing soon after birth (aim within 2 hours) with easy access to support, training and equipment.
- Early colostrum (ideally within 6 hours of birth and within 24 hours) to be the first enteral feed given to baby.

Improvement plan

The project recognised the need to increase the availability of mother's breastmilk within 24 hours, to ensure that mother's breastmilk is available at day 14 and to enhance breastfeeding rates at discharge. Further to this, the project's main aims were to:

- Achieve staff consistency in information delivery to mothers across Newborn Services and Maternity.
- Increase staff awareness of the benefits of early breast milk.
- Improve the quality of information provided to parents about all aspects of expressing.
- Drive to improve standards of breastmilk administration from within 6 hours of birth to within 2 hours, with a new expressing method of hand massage, double electric pumping then hand expressing.
- Increase Maternity and Inreach pump training and availability.
- Provide refreshers on staff training and refocus on establishing Feeding Champions.
- Rebrand breastmilk, expressing and feeding under a 'Golden Drops' umbrella.

Outcomes

The NNAP 2020 report shows that we had 76.6% babies <32/40 receiving mother's own milk at 14 days old (national average 82%) while our predicted data for 2021 so far shows a mean of 77.3%. While this seems like a modest improvement, our monthly figures are promising for gradual sustained change.

In 2020 we had 61.5% babies <32/40 receiving mother's own milk at discharge (national average 60%) but this has now increased to a mean of 67.2%, which we are delighted with.

Top tips for implementation

We feel that more Infant Feeding Champions funding and time allocated to the quality improvement programme would have a significant effect on breastfeeding outcomes and we will continue to seek ways to facilitate this.

3.2. Ward clerks as agents for change: Improving documentation of parental conversations

Dr Catriona Firth, Dr Jonathan Reeves, Dr Izzati Abd Wahab, Neonatal Unit, Bradford Teaching Hospitals NHS Foundation Trust.

Background

Bradford Hospital was a negative outlier for the NNAP measure documenting parental consultations within 24 hours. Attempts to improve this by consultant feedback, dissemination of a weekly learning poster and by reinforcement with trainee medical and advanced neonatal nurse practitioner (ANNP) staff, had been unsuccessful. Furthermore, rotating medical staff made achieving consistency in ensuring these conversations occurred and were documented to the high standard required, was challenging.

These challenges were exacerbated by the pandemic, with visiting restrictions and parental sickness affecting parental presence. The trend in the success rate of documenting these conversations also loosely correlated with the 6-monthly intervals of junior staff change. Although the trend improved as staff learned to consult and document their conversations, there remained a need for consistency to compensate for staff changes.

To monitor our performance, we continued to display NNAP data at monthly intervals. Success was however obvious in real-time as ward clerks reminded staff of new admissions and whether consultations had been documented each morning. This provided opportunities for early remediation.

Improvement plan

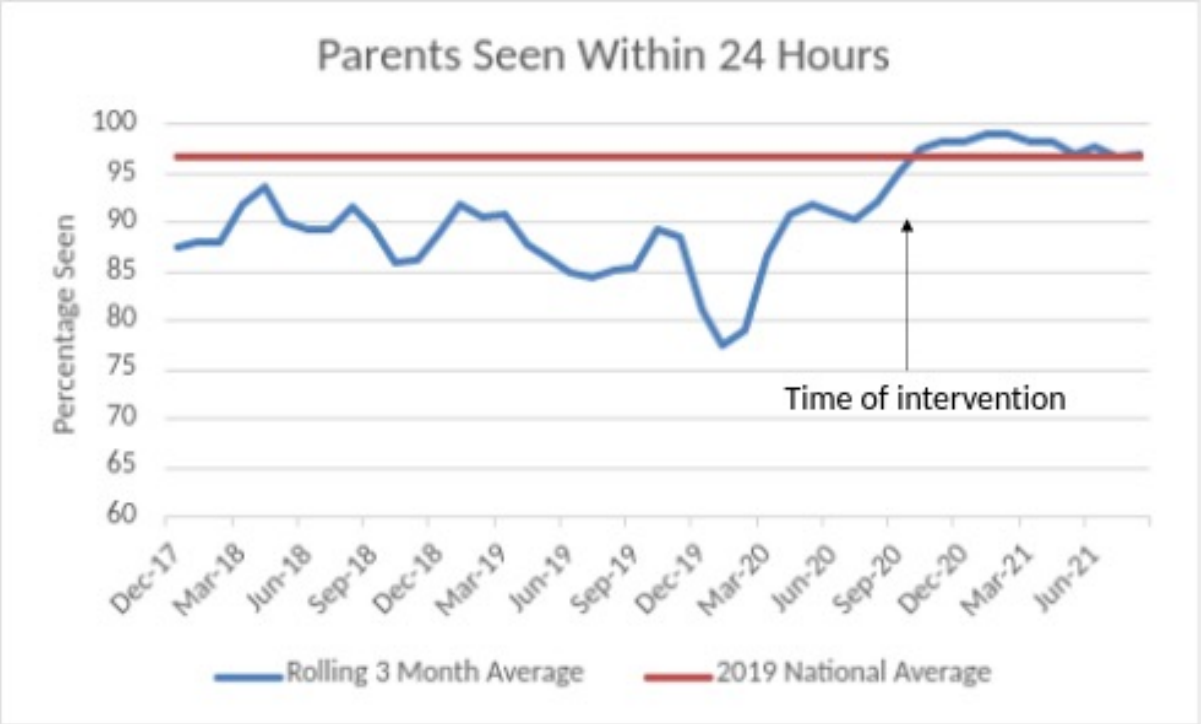
Our improvement plan is illustrated in Figure 1. Ward clerks were included in the morning safety huddle and now have a designated role: to highlight how many admissions have occurred in the past 24 hours and whether parental conversations have been documented on BadgerNet. This has ensured that each morning there is a reminder to do so and a safety-net to allow these conversations to still take place within the 24-hour standard.

Figure 1. Ward clerk briefing the safety huddle

Outcomes

- Since introducing this measure we have been achieving a success rate of 95% and above - with many months at 100%. Historically, we had been achieving as low as 67% and never had we achieved 100% within the past 3 years. (See Figure 2 for more details).
- We believe that parental partnership in care begins early and find that a first conversation can be very important in shaping how parents experience their baby's care.
- "It's been brilliant having real time feedback of how we are doing on this measure" -Consultant, Bradford Neonatology.
- We feel this change will be self-sustaining. Even when our ward clerks are on leave, the huddle prompt is quickly addressed – although typically communication has already been encouraged by the presence of this failsafe.

Figure 2. Percentage of parents consulted as rolling 3 monthly averages compared to national average (NNAP 2019 data)



Top tips for implementation

We have found this is a really simple method to ensure the whole team is aware of parental consultations and our ward clerks have taken an even more active role in the neonatal unit. We suggest you give it a try!

3.3. Project PEEP: Introduction of a Preterm Respiratory Care Bundle on NICU

Lucy Bradley ANNP; Dr Teim Eyo, Jo Jones, Zara Grandison, Yvonne Huskins, Dr Nitesh Singh - Neonatal Intensive Care Unit, University Hospitals Coventry and Warwickshire NHS Trust

Background

A quality improvement (QI) team of enthusiastic interdisciplinary individuals was formed to develop strategies to reduce the incidence of bronchopulmonary dysplasia on our neonatal intensive care unit. We planned to achieve this through implementation of a preterm respiratory care bundle, primarily focusing on reduction in delivery room intubation and emphasis towards non-invasive ventilation and less invasive surfactant administration (LISA).

Improvement plan

Rates of bronchopulmonary dysplasia (BPD) or death as published by the National Neonatal Audit Programme (NNAP 2019) were 3.6% higher at our level 3 NICU than the national rate.

We planned to measure improvement using our database and BadgerNet data to identify rates of babies intubated at birth and compare results year on year throughout the QI process.

We sought to identify and compare oxygen requirement at 28 days as a possible early indicator of improvement in BPD incidence, with the intention of evaluating true BPD rates at the end of the year 2021.

The strategy was comprised of 4 cycles. Cycle 1 involved training staff in using LISA; cycle 2 implemented this technique, cycle 3 introduced delivery room nasal CPAP (DRCPAP) and cycle 4 focused on staff training in using video-laryngoscopy.

Outcomes

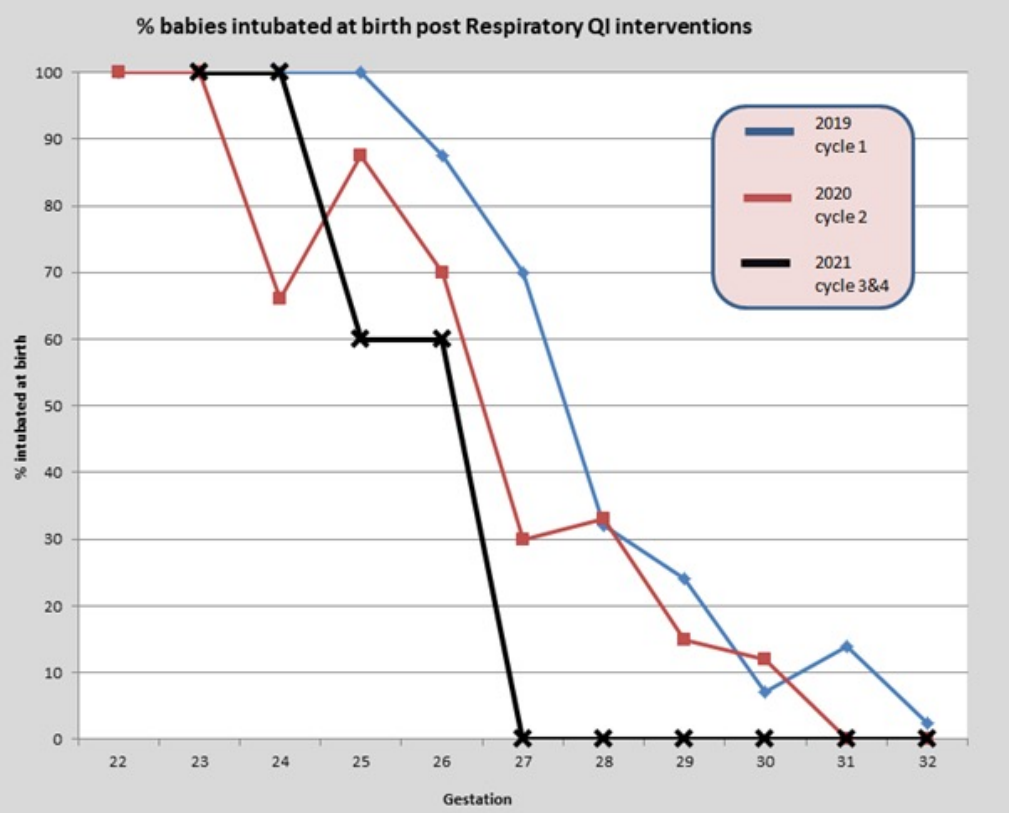
Overall, there was an increase in respiratory support days, primarily non-invasive.

The care bundle has seen an overall reduction in delivery room intubation for babies born under 32 weeks' gestation (see Figure 1). This reduction is more noticeable between 27-32 weeks' gestation, as over the 4-cycle period the rates of intubation decreased from 70% to 0%. Between 25-27 weeks our rates of delivery room intubation have reduced by approximately 30-40%.

Preliminary analysis of rates of oxygen use beyond 28 days has dropped by almost half for babies between 27-32 weeks' gestation during the QI intervention period.

Successful implementation of QI methodology facilitating the introduction of a preterm respiratory care bundle has resulted in a significant decrease in the number of babies intubated at birth, potentially positively influencing the rate of BPD. We believe the care bundle has promoted standardised assessment and planning of care, rather than care based on gestational age or personal bias.

Figure 1. Percentage of babies intubated at birth post respiratory QI interventions



Top tips for implementation

We have found that inclusion of all members of the interdisciplinary team has helped significantly with adoption of practices, however the acceptance of change in practice for some of the more senior members of the nursing team remains one of the biggest challenges.

In hindsight a more stepwise approach to application of the practice changes per gestational age might have had a more convincing effect, however this would be difficult to achieve in a timely manner.

3.4. Implementation of delayed cord clamping in all preterm infants

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Background

Prior to 2019, we were practising umbilical cord milking (UCM) in all preterm infants in our unit. With increasing evidence on physiological deferred or delayed cord clamping being the best method for optimal cord management (OCM), we wanted to change our practice from UCM to delayed cord clamping (DCC). We started this quality improvement project (QIP) in June 2019. Soon afterwards the NNAP introduced DCC as a new pilot measure for 2020. This allowed us to focus more on this QIP over the next 18 months to slowly improve our rates of DCC.

As per the latest BAPM guidance, DCC for at least 1 minute is the preferred method of OCM in preterm infants. Our aim was to introduce this alongside respiratory stabilisation using high flow nasal cannula oxygen (HFNC). We aimed to facilitate preterm babies to have physiological transition of breathing established over 1-3 minutes before cord clamping called the new 'ABC' approach – airway patient, breathing established and then cord clamping to be done, ideally after 3 minutes.

The new BAPM toolkit on OCM published in December 2020 was very helpful to further the engagement of all staff members.

In addition to introducing a new practice, we faced resistance due to a need to change our practice from UCM to DCC. This needed a multi-disciplinary team approach between maternity, neonatal and theatre staff and a number of ongoing audit cycles using NNAP data to achieve our aims.

Improvement plan

We started implementing this change in November 2019, initially with the aim of implementing a minimum of 30 seconds of DCC to promote team confidence with this change in practice. We were achieving around 60 -70% success rates for DCC in our first PDSA cycle from November 2019 to February 2020.

We reviewed the cases and identified common themes for failure to implement DCC and addressed these in the following 6 months. These included poor communication between team members; lack of confidence if the baby wasn't breathing/looked pale; equipment issues and special circumstances like monochorionic twins. We set out clear roles/ responsibilities for each team member to communicate well, provided more training through simulation and had an additional competent senior member attending the extreme preterm delivery to support DCC, and updating the guidelines to support DCC in monochorionic twins. We also shared our data regularly through monthly newsletters.

In the next PDSA cycle between March-August 2020, we noted that our rates of DCC were fluctuating on and off and that new members of the team had limited training. So, we incorporated a mandatory session for 1 hour in doctors' induction every 6 months. Furthermore, to help with consistent training, we produced two training videos to be shown to all new staff, and for regular training updates. We also introduced a new pack with all the consumables needed for initial stabilisation for the first 5 minutes, which facilitated equipment preparation. Additionally, we streamlined the equipment checking process for every shift, to ensure it was always ready.

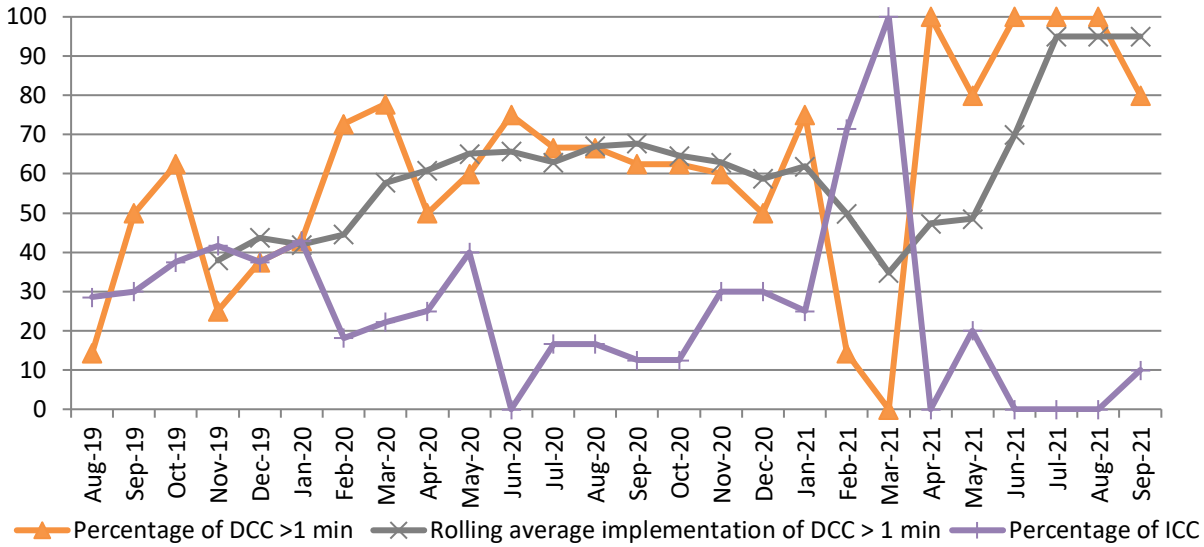
In the final PDSA cycle from September 2020 to February 2021, we introduced a new preterm birth checklist to be used by the midwife and a new parent information leaflet to be given to all parents at booking to inform them of the benefits of DCC. Consequently, we have seen our rates of DCC remain consistently >90%. This also coincided with the release of BAPM toolkit which helped obstetricians and midwives to engage further.

We are working to embed these changes in our ongoing practice and continue to audit our rates using the NNAP data.

Outcomes

The project successfully changed the practice from UCM to DCC to optimise the cord management at birth in all preterm infants. Slowly and steadily, we were able to address the barriers to changes with this QIP. Figure 1 below shows the results of this QIP since the implementation in November 2019.

Figure 1. Rates of implementation of Deferred Cord Clamping



*ICC = Immediate cord clamping.

In the first 12 months, we were able to achieve an average of 75% of implementation rates every month. However, with the launch of the BAPM toolkit, we were able to push the focus more, especially amongst the obstetricians and midwifery staff. The BAPM toolkit also provided guidance on special circumstances like management of a short cord, twins, and placental abruption.

Since February 2021, we improved our average rates of DCC implementation from 75% to 95%. Reasons for not achieving DCC include cord snapping at birth, short cord, and severe placental abruption.

Overall, the implementation rates have improved and the change in practice has now been incorporated into routine practice. We will continue to review our data on a monthly basis using NNAP.

Top tips for implementation

We found it very useful to discuss the situation with other units who were already implementing DCC. Subsequently, the lead consultant for this QIP has provided 1-to-1 support to a number of doctors/midwives interested in implementing this in other units outside the network by demonstrating the practice and providing guidance as necessary.

4. Driving improvements in neonatal care

4.1. Recommendations and action plan development

Recommendations are listed by theme in section 2 and by audience in section 5.

What to do next:

- Share your unit's NNAP results with your multidisciplinary team, using NNAP Online and the NNAP results presentation template https://www.rcpch.ac.uk/nnap-annual-report-2020-data.
- With the multidisciplinary team, set goals and develop action plans where your unit results require improvement, and your unit is not meeting the audit recommendations.
- Download your unit results poster from NNAP Online and populate poster two with information for service users about your action plan. Display your posters in the neonatal unit.
- Use the NNAP recommendations checklist Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data to track your unit, Trust/Health Board or network's status.
- Monitor your unit's performance through the year using NNAP quarterly reports and real time data. Regularly revisit the recommendations checklist and your unit's action plan throughout the year.

4.2. Resources to support improvement

Full audit results

Full results and methodology to accompany this report can be found in Appendix A: Results and Methods, *NNAP Annual Report on 2020 data*, available at: https://www.rcpch.ac.uk/nnap-annual-report-2020-data.

NNAP Online: NNAP results at unit, network and national level are hosted on NNAP Online. We recommend that neonatal units and networks use NNAP Online to view their results and compare themselves against other units of the same designation. Use it to share results with the wider team, share best practice between units and networks, and to stimulate quality improvement activities.

BAPM and NNAP Quality Improvement Toolkits

In collaboration with the NNAP, BAPM have produced the following quality improvement toolkits to support services with their improvement journey:

- Antenatal Optimisation Toolkit: supports implementation of key elements of antenatal optimisation, which include identification of women at risk of preterm birth, appropriate administration of antenatal steroids, magnesium sulphate and antibiotics, and birth in the right place.
- Improving Normothermia in Very Preterm Infants: supports neonatal units wishing to improve their rate of normal temperature taken on time.
- Optimal Cord Management Toolkit: supports neonatal units implementing cord clamping at or after 60 seconds.
- Optimising Early Breastmilk for Preterm Infants, which is aimed at those leading or involved in improvement work on maternal breastmilk feeding. The toolkit focusses on five core elements that support early breastmilk feeding; parents as equal partners in their baby's care, antenatal education, initiation of expressing soon after birth, early colostrum, and early and regular parental physical contact with their baby.

Neonatal services that identify improvement priorities in these areas should use the toolkits to support their projects.

RCPCH QI Central

QI Central is the RCPCH quality improvement sharing hub where you can find resources and examples of interventions in a number of clinical practice areas. You can find this year's NNAP case studies, as well as those from previous years, on QI Central.

Maternal and Neonatal Safety Improvement Programme (MatNeoSIP)

MatNeoSIP is a programme to support improvement in the quality and safety of maternity and neonatal units across England – formerly known as the Maternal and Neonatal Health Safety Collaborative. The programme supports frontline staff to create the conditions for continuous improvement, a safety culture and a national maternal and neonatal learning system.

Other useful resources

- **Bliss Baby Charter** https://www.bliss.org.uk/health-professionals/bliss-baby-charter/what-is-the-baby-charter/the-story-of-the-baby-charter
- **UNICEF Baby Friendly Initiative** https://www.unicef.org.uk/babyfriendly/
- **Maternity and Children Quality Improvement Collaborative (MCQIC) resources:** www.ihub.scot/improvement-programmes/scottish-patient-safety-programme-spsp/maternity-and-children-quality-improvement-collaborative-mcqic/. MCQIC is part of the Scottish Patient Safety Programme. A number of QI resources are available on their website.
- **Neonatal Qualified in Specialty (QIS) Education and Training Review**, Health Education England https://www.hee.nhs.uk/our-work/maternity/neonatal/neonatal-qualified-specialty-qis-education-training-review
- **PERIPrem (Perinatal Excellence to Reduce Injury in Premature Birth)** perinatal care bundle resource https://www.weahsn.net/our-work/transforming-services-and-systems/periprem/
- **NICE guideline [NG124] Specialist neonatal respiratory care for babies born preterm** https://www.nice.org.uk/guidance/ng124

4.3. Information for parents, carers and families

Your baby's care is a parent and carer's guide to the NNAP and the audit results. Available in English and Welsh, it tells families; what the audit is, what it aims to achieve, explains the results for key audit measures, and what families can do in response to the results. We ask units to make the booklet available to parents and carers in their unit. Your baby's care is available from: https://www.rcpch.ac.uk/nnap

The NNAP privacy notice Your baby's information is available in English and Welsh here: www.rcpch.ac.uk/resources/national-neonatal-audit-programme-your-babys-information

The NNAP unit results posters summarise a selection of the unit's NNAP results that are most relevant to parents, families and wider members of the multidisciplinary team caring for the baby. Neonatal units display the posters in a public area, and complete a second poster, which explains the actions they are taking in response to their audit results. Designed to be used alongside Your baby's care, the posters help to communicate the meaning and relevance of the audit results not only to parents, but to the wider team involved in caring for the baby and mother.

NNAP unit results posters can be downloaded from NNAP Online at: www.nnap.rcpch.ac.uk.

All our information for parents, carers and families is developed in collaboration with our parent, nurse and charity representatives.

4.4. Future developments in the NNAP

The NNAP has evolved over a number of years, with increased focus on important outcomes of neonatal care, through the introduction of background adjusted mortality and bronchopulmonary dysplasia (BPD) reporting, necrotising enterocolitis (NEC) and pre-term brain injury metrics. The audit has focused on key processes of optimal perinatal care by introducing measures of birth in the right place, delayed cord clamping and early breastmilk feeding.

The new measure of pre-term brain injury introduced in 2021 seeks to answer the question;

Does a baby born at less than 32 weeks' gestation experience any of the following forms of brain injury?

- *Germinal matrix/intraventricular haemorrhage*
- *Post haemorrhagic ventricular dilation*
- *Cystic periventricular leukomalacia*

Looking forward to the future of the audit, the NNAP's improvement strategy sets out four approaches to stimulating improvement:

1. High quality data outputs that identify areas for action and support stakeholders' improvement initiatives.
2. Sharing of best practice and quality improvement resources.
3. Collaboration and engagement with regional and national initiatives.
4. Parent and public engagement.

The overall success of the strategy will be monitored against identified improvement goals which reflect existing national priorities and are consistent with quality improvement objectives. The three areas of focus are: reducing the mortality difference between networks with the highest and lowest rates of risk adjusted mortality, increasing the proportion of babies receiving all appropriate elements of optimal perinatal care, and reducing the proportion of babies discharged home having experienced any serious complication of prematurity.

The introduction of the new data flow methodology this year will allow the NNAP to improve the responsiveness and utility of NNAP reporting and therefore allow for timely benchmarking of unit and network performance, help to rapidly identify variation and facilitate improvements in the quality of care for the benefit of neonatal units and networks, and the babies and families that they care for.

The flow of data directly to the RCPCH has allowed the NNAP Project Team to create an NNAP data dictionary and to increase transparency around the methodology and analyses applied. This will allow the NNAP to explore opportunities for linkage, for example the possibility of linking to the Second Generation Surveillance System (SGSS) dataset held by Public Health England and the Healthcare Associated Infection and Antimicrobial Resistance Programme (HARP) run by Public Health Wales for reporting neonatal bloodstream infection rates.

Having established a secure data flow in line with data protection legislation, in an organisation with very wide membership and accountability, NNAP recognises that there may be further opportunities for secondary use of the data in the interest of babies and their families. NNAP will explore these opportunities in an accountable and open fashion, in association with RCPCH and NNAP governance bodies. We will collaborate with the BAPM Data and Informatics Group where relevant, and support development of an NHS-owned Information Standard.

5. Glossary of terms

BAPM	The British Association for Perinatal Medicine improves standards of perinatal care by supporting all those involved in perinatal care to optimise their skills and knowledge, promote high quality, safe and innovative practice, encourage research, and speak out for the needs of babies and their families. https://www.bapm.org/
BPD	Bronchopulmonary dysplasia
Bliss	Bliss is a national charity for babies born premature or sick. It exists to give every baby born premature or sick in the UK the best chance of survival and quality of life. Bliss supports families, campaigns for change and supports professionals, and enables life-changing research. https://www.bliss.org.uk
DCC	Deferred cord clamping
GIRFT	Getting It Right First Time (GIRFT) is a national programme designed to improve the treatment and care of patients through in-depth review of services, benchmarking, and presenting a data-driven evidence base to support change[5].
HQIP	The Healthcare Quality Improvement Partnership (HQIP) aims to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. https://www.hqip.org.uk/
HRG	Healthcare resource group: Standard groupings of clinically similar treatments which use common levels of healthcare resource.
Hyperthermia	A body temperature more than 37.5°C
Hypothermia	A body temperature less than 36.5°C
LNU	Local neonatal units (LNUs) provide neonatal care for their own catchment population, except for the sickest babies. They provide all categories of neonatal care, but they transfer babies who require complex or longer-term intensive care to a NICU, as they are not staffed to provide longer-term intensive care. Most babies over 27 weeks gestational age will usually receive their full care, including short periods of intensive care, within their LNU. Some networks have agreed variations on this policy, due to local requirements. Some LNUs provide high dependency care and short periods of intensive care for their network population. LNUs may receive transfers from other neonatal services in the network, if these fall within their agreed work pattern[6].

MatNeoSIP	The Maternity and Neonatal Safety Improvement Programme (MatNeoSIP), formerly known as the Maternal and Neonatal Health Safety Collaborative, is the programme supporting improvement in the quality and safety of maternity and neonatal units across England. https://www.england.nhs.uk/mat-transformation/maternal-and-neonatal-safety-collaborative/
MBRRACE-UK	Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK. https://www.npeu.ox.ac.uk/mbrrace-uk
NCAPOP	National Clinical Audit and Patient Outcomes Programme
NEC	Necrotising enterocolitis
NHSE	NHS England
NICE	National Institute for Health and Care Excellence
NICU	Neonatal intensive care units (NICUs) are sited alongside specialist obstetric and feto-maternal medicine services and provide the whole range of medical neonatal care for their local population, along with additional care for babies and their families referred from the neonatal network. Many NICUs are co-located with neonatal surgery services and other specialised services. Medical staff in a NICU should have no clinical responsibilities outside the neonatal and maternity services[6].
NMPA	The National Maternity and Perinatal Audit is a national clinical audit of NHS maternity services in England, Scotland and Wales. The audit, commissioned by HQIP, is led by the Royal College of Obstetricians and Gynaecologists in partnership with the Royal College of Midwives (RCM, the Royal College of Paediatrics and Child Health (RCPCH) and the London School of Hygiene and Tropical Medicine (LSHTM). www.maternityaudit.org.uk
NNAP	National Neonatal Audit Programme
Normothermia	A body temperature between 36.5°C and 37.5°C
ODN	Operational delivery network: In England, managed clinical networks for the coordination of neonatal critical care.
Outlier	A result that is statistically above or below expected performance. The NNAP defines outliers in four categories: • outstanding: three or more standard deviations above expected performance • excellent: between two and three standard deviations above expected performance • alert: between two and three standard deviations below expected performance • alarm: three or more standard deviations below expected performance.

PDSA	Plan, do, study, act
PERIPrem	Perinatal Excellence to Reduce Injury in Premature Birth https://www.weahsn.net/our-work/transforming-services-and-systems/periprem/
PReCePT	The Prevention of Cerebral Palsy in PreTerm Labour. https://www.weahsn.net/our-work/transforming-services-and-systems/precept/
Preterm	Preterm is defined by the World Health Organisation as a baby born alive before 37 weeks of pregnancy are completed. This definition is sub-categorised by gestational age: • extremely preterm (less than 28 weeks) • very preterm (28 to 32 weeks) • moderate to late preterm (32 to 37 weeks).
QI	Quality improvement
RCPCH	The Royal College of Paediatrics and Child Health (RCPCH) was founded in 1996 and now has over 17,000 members across the world. The RCPCH plays a major role in postgraduate medical education, professional standards, research and policy. https://www.rcpch.ac.uk
RCOphth	Royal College of Ophthalmologists
ROP	Retinopathy of prematurity
SCU	Special care units (SCUs) provide special care for their own local population. Depending on arrangements within their neonatal network, they may also provide some high dependency services. In addition, SCUs provide a stabilisation facility for babies who need to be transferred to a neonatal intensive care unit (NICU) for intensive or high dependency care, and they also receive transfers from other network units for continuing special care[6].

6. References

[1] NHS England. *Maternity and Neonatal Safety Improvement Programme*. https://www.england.nhs.uk/mat-transformation/maternal-and-neonatal-safety-collaborative/

[2] NHS England. *Neonatal Critical Care Service Specification*. 2016. Available from https://www.england.nhs.uk/commissioning/spec-services/npc-crg/group-e/e08/.

[3] British Association for Perinatal Medicine. *Service Standards for Hospitals Providing Neonatal Care (3rd edition*). Available at: https://www.bapm.org/resources/32-service-standards-for-hospitals-providing-neonatal-care-3rd-edition-2010

[4] Watson S., et al. On behalf of the Neonatal Data Analysis Unit (NDAU) and the Neonatal Economic, Staffing, and Clinical Outcomes Project (NESCOP) Group. The effects of a one-to-one nurse-to-patient ratio on the mortality rate in neonatal intensive care: a retrospective, longitudinal, population-based study. *Archives of Disease in Childhood - Fetal and Neonatal Edition*. 2016;101:F195-F200. Available at: https://www.ncbi.nlm.nih.gov/pubmed/26860480.

[5] NHS England and NHS Improvement. *Getting It Right First Time*. https://www.gettingitrightfirsttime.co.uk/

[6] Department of Health. *Toolkit for high quality neonatal services*. 2009. Available from https://webarchive.nationalarchives.gov.uk/ukgwa/20100604134939/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

National Neonatal Audit Programme (NNAP)
Annual report on 2020 data

Published by RCPCH March 2022

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