

The PERIPrem Bundle: Perinatal Excellence in Reducing Injury in Premature birth



Project Briefing Document

The Case for Change

The NHS Long Term Plan highlights reducing newborn brain injury as a priority. Currently, the NHS is working towards a target reduction of 50% by 2025.

Newborn brain injury rates include preterm and term cases. To date, a large amount of work has focused only on term babies. PERIPrem is a care bundle of 10 interventions for both the mother and preterm baby (less than 34 weeks) that will, when delivered by the perinatal team, optimise neonatal outcomes.

The West of England AHSN has contributed to reducing cerebral palsy due to preterm brain injury through the roll out at scale of PReCePT, a national AHSN programme. Building on the successes and learning from the challenges faced in designing and implementing PReCePT, the West of England AHSN has identified an evidence based, preterm neuroprotection care bundle that has the potential to reduce severe preterm brain injury and death.

The PERIPrem Bundle will align with the work of the Maternity and Neonatal Safety Improvement Programme through supporting the “Improving the optimisation and stabilisation of the very pre term infant” key driver. BAPM is collaborating with National Neonatal Audit Programme (NNAP), and other perinatal organisations

to launch toolkits in the form of a perinatal optimisation bundle. The PERIPrem Bundle will align with national strategy and work in partnership with BAPM to ensure that learning is shared to further improve outcomes for preterm neonates and to enable collaborative working in this field.

The approach

The PERIPrem Bundle has been developed through the creation of a cross organisational partnership between West of England AHSN, South West AHSN, University Hospitals Bristol and Great Western Hospitals following the merger of two Evidence Into Practice applications both aimed at proactively managing the risk of brain injury and mortality in preterm babies. It is being delivered in partnership with the [South West Neonatal Network](#).

Led by Dr Karen Luyt (Academic Neonatologist, UHBristol) and Dr Sarah Bates (Consultant Paediatrician and Neonatologist, GWH) as Neonatal clinical leads, supported by Ann Remmers, (WEAHSN Maternal and Neonatal Clinical lead), Consultant Obstetricians Dr Emma Treloar, Dr Charlotte Sullivan and Dr Tracey Kay and Consultant Neonatologist Dr Wisam Muhsen, this bundle will facilitate a perinatal team approach to preterm labour and management of the preterm baby. A key outcome will be the fostering of perinatal working culture focused on preterm birth to enable this enhanced way of working.

The bundle consists of ten elements, each identified as central to reducing brain injury and mortality in extreme preterm (<27 weeks) and preterm (<34 weeks) birth. A number of elements of the bundle are currently standard practice, for instance Magnesium Sulphate (PReCePT) but there is variability in uptake of the other elements across the region. The PERIPrem Bundle seeks to reduce variability across the region

and to improve compliance. The PERIPrem Bundle will align with the strategic aims of the South West Neonatal Operational Delivery Network (ODN) and build on the work they have done in supporting our regional units improve outcomes for preterm babies.

The West of England AHSN will also be working in partnership with Health

Innovation Network (HIN) to roll out the QUIPP App, together with increasing use of Fetal Fibronectin, to aid decision making around prediction of preterm delivery. This will support the design and implementation of the PERIPrem Bundle as ensuring that women are treated in the right place, at the right time, with the right intervention is central to the success of the bundle in optimising survival free from brain injury.

A Quality Improvement (QI) approach (building on the lessons learned through PReCePT) will be employed to foster the perinatal working team dynamic and to upskill unit teams to design effective and innovative interventions that are responsive to the nuances of the individual units. The design and implementation of the PERIPrem Bundle will inform future perinatal QI and will form a basis for roll out at scale.

Place of Birth

85% of babies delivered at less than 27 weeks or with an expected birth weight of under 800 grams (less than 28 weeks for multiple births) should be born in a maternity service on the same site as a designated NICU.

[Ref: 1,2,3,4,]



Antenatal Steroids

85% of mothers who give birth at less than 34 weeks gestational age should receive the correctly timed, full course of antenatal steroids.

[Ref: 2,4,5,6]



Antenatal Magnesium Sulphate

85% of mothers who give birth at less than 30 weeks gestational age should receive antenatal Magnesium Sulphate.

[Ref: 2,4,5,6]



Deferred Cord Clamping

85% of babies born at less than 34 weeks gestational age should have their cord clamped at or after one minute.

[Ref: 2,4,7]



Normothermia

90% of babies born at less than 34 weeks gestational age should have a temperature on admission which is both between 36.5–37.5°C and measured within one hour of birth.

[Ref: 2,4]



Early Maternal Breast Milk (MBM)

85% of babies born at less than 34 weeks gestational age should receive MBM within 6 hours of birth.

Units should monitor (and aim to increase) rates of first MBM within 6 hours of birth for babies born at less than 34 weeks gestational age.

MBM feeding at 14 days - Units should monitor (and aim to increase) rates of babies born at less than 34 weeks gestational age receiving MBM at 14 days of age.

[Ref: 2,8]



Caffeine

100% of eligible babies should be started on caffeine as soon as possible (aim within the first 6 hours... NICE says: "starting it as early as possible and ideally before 3 days of age") in all babies:

- Less than 30 weeks gestation (consider 32 - 34 weeks)
- Birth weight less than 1500g

[Ref 9,10]



Probiotics

100% of eligible babies (less than 32 weeks, less than 1500g birth weight) should be commenced on a multi strain probiotic of choice with their first non nutritive feed.

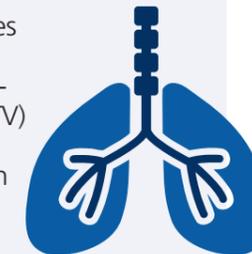
[Ref 11]



Volume Guarantee (VG) or Volume Targeted Ventilation (VTV)

100% of preterm babies who need invasive ventilation, use volume-targeted ventilation (VTV) in combination with synchronised ventilation as the primary mode of respiratory support.

[Ref 10]



Prophylactic Hydrocortisone

85% of babies <28 weeks gestation should receive prophylactic hydrocortisone from day 0 of life.

[Ref 10]



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3. Helenius K, Longford N, Lehtonen L, Modi N, Gale C. Association of early postnatal transfer and birth outside a tertiary hospital with mortality and severe brain injury in extremely preterm infants: observational cohort study with propensity score matching. *bmj*. 2019 Oct 16;367:l5678.
4. BAPM: Perinatal Management of Extreme Preterm Birth Before 27 Weeks of Gestation (2019). Available at www.bapm.org
5. NICE Guidance for Preterm Birth (2019) <https://www.nice.org.uk/guidance/ng25>
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7. Rabe H, Gyte GML, Diaz-Rossello JL, Duley L. Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes. *Cochrane Database of Systematic Reviews* 2019, Issue 9. Art. No.: CD003248. DOI: 10.1002/14651858.CD003248.pub4
8. Parker MG, Melvin P, Graham DA et al. Timing of First Milk Expression to Maximize Breastfeeding Continuation Among Mothers of Very Low-Birth-Weight Infants. *Obstet Gynecol*. 2019b;133(6):1208-1215
9. <http://swneonatalnetwork.co.uk/media/107035/swnn-guideline-caffeine-use-in-preterm-infants-rs.pdf>
10. Specialist neonatal respiratory care for babies born preterm, NICE guideline [NG124]Published date: April 2019 <https://www.nice.org.uk/guidance/ng124/chapter/Recommendations>
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Methodology

All trusts across the West and South West of England are invited to co-design, co-produce, implement and adopt the bundle, with the aim to reduce variability in outcomes with respect to survival, free of severe brain injury, in babies delivered below 34 weeks gestation.

The project will employ QI methodology and use the Institute for Healthcare Improvement (IHI) model for improvement, spread, and adoption. The PReCePT project, national programme and PReCePT study, has provided evidence for the successful implementation of Magnesium Sulphate. A similar method for design, adoption, and spread will be used for this bundle.

Co-design and co-production (a core principle of this approach) with unit-level perinatal teams, patient partners and the wider regional clinical community will ensure that the elements of the bundle are designed collaboratively and with a regional clinical consensus. The facilitation and development of the perinatal dynamic is central to the effective delivery of the elements of the bundle. Building on evidence of the impact of effective perinatal teams in improving neonatal outcomes, attention will be given to the formation and sustainability of the perinatal dynamic in the region.

Patient engagement of women and partners who have lived experience of preterm birth is central to the design and implementation of the bundle and will include regional engagement with a diverse range of socio-economic and ethnic groups. This is reflective of the fact that a higher prevalence of preterm birth is associated with social determinants of health amongst particular groups.

Timescales and measures of success

All maternity units across South West England will be supported to optimise compliance with the complete bundle for all eligible mothers who deliver their babies at less than 34 weeks gestation to 70% or more by December 2020. Each intervention will be monitored individually with more specific targets (e.g. antenatal steroids - 85% compliance), allowing units to celebrate successes even before reaching the overall compliance target. Other indicators of success will include the development of the perinatal team culture at unit level and increased QI capability within the region.

For Further information please contact:

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