

Evaluating Perinatal Excellence to Reduce Injury in Premature Birth (PERIPrem)



Background

Preterm birth is the single biggest cause of infant mortality and newborn brain injury in England. The NHS Long Term Plan has committed to realising a 50% reduction in stillbirth, maternal and neonatal mortality, and serious brain injury by 2025, with an increased focus on preterm mortality.

About PERIPrem

PERIPrem is a unique care bundle of 11 evidence-based interventions for mothers and preterm babies.

- Implemented in 12 Trusts across the South West region.
- Led by the South West and West of England Academic Health Science Networks (AHSNs) in partnership with the South West Neonatal Network.
- Co-design and co-production approach, rooted in Quality Improvement (QI) methods.
- Involving unit-level perinatal teams, parents with lived experience of preterm birth, and the wider regional clinical community.

The evaluation

The South West AHSN was commissioned to evaluate PERIPrem to understand the effectiveness of using QI methodology to support maternity and neonatal units in implementing a standardised bundle of care to mothers who deliver their babies at less than 34 weeks' gestation.

What we did

We studied changes over time before PERIPrem started (January 2019) and during the implementation phase (July 2020-June 2021).

- Mixed-model data analysis to understand which PERIPrem interventions were received by women who gave birth to a baby <34 weeks' gestation.
- Linear mixed-model data analysis of two staff surveys on psychological safety and teamwork, carried out at the beginning and end of the implementation phase.
- 47 qualitative interviews with 29 staff (maternity, neonatal and obstetric) and QI coaches, over two timepoints.
- Qualitative data analysis using behavioural science methods.

What we found

Over the evaluation period 693 babies were born to 604 mothers.



Read the evaluation

What we found

By the end of the implementation phase (July 2020–June 2021):

- Improvements (between 8 and 63%) in the delivery of 10 of the 11 interventions: place of birth, antenatal steroids, optimal cord management, thermoregulation, caffeine, early breast milk, probiotics, prophylactic hydrocortisone.
- Significantly more women and babies (from 3 to 29%) were receiving all the interventions they were eligible for.
- Increase (55 to 78%) in the percentage of interventions women and babies were receiving. (See table below.)

Over the implementation phase:

- Improvements in ventilation, early breast milk, multi-strain probiotics and prophylactic hydrocortisone, and a steady improvement in optimal place of birth for the most preterm infants.
- Improved team function, situation monitoring and communication within perinatal teams.

Table: Changes in adherence to the interventions from pre- to post-implementation.

	2019 n (%)	2021 n (%)	Probability [95% CI]	p
Mothers and babies receiving all eligible elements	3 (3%)	35 (29%)	0.96 [0.87 to 0.99]	<0.001*
Place of Birth	7 (44%)	12 (75%)	0.92 [0.60 to 0.99]	0.022*
Antenatal Steroids	68 (57%)	107 (89%)	0.87 [0.73 to 0.94]	<0.001*
Magnesium Sulphate	33 (75%)	32 (86%)	0.62 [0.43 to 0.78]	0.197
Intrapartum Antibiotics	31 (66%)	29 (62%)	0.65 [0.33 to 0.88]	0.351
Optimal Cord Management	63 (60%)	95 (79%)	0.73 [0.60 to 0.83]	0.002*
Thermoregulation	89 (74%)	98 (82%)	0.63 [0.53 to 0.72]	0.010*
Ventilation	41 (87%)	39 (95%)	0.34 [0.01 to 0.97]	0.750
Caffeine	35 (80%)	35 (95%)	0.97 [0.83 to 0.99]	<0.001*
Early Breast Milk	14 (12%)	76 (63%)	0.94 [0.90 to 0.96]	<0.001*
Probiotics	10 (14%)	39 (54%)	0.98 [0.83 to 1.00]	0.002*
Prophylactic Hydrocortisone	4 (24%)	20 (87%)	1.00 [0.99 to 1.00]	<0.001*
	2019 (%)	2021 (%)	Mean Difference (%)	p
% of interventions received by mothers and babies	55%	78%	23.4%	<0.001*

*statistically significant changes p<0.05

Facilitating PERIPrem implementation

Interviewees shared what helped or hindered them when implementing PERIPrem.

Capability, motivation and opportunity were the three main enablers to implementation.

Staff capability

- Increasing knowledge, skills and confidence in delivering the interventions.
- Breaking down the bundle.

Staff motivation

- Emphasising the existing evidence-base.
- Using own data to understand the impact of their change ideas.
- Building a trusted and recognisable brand.

Staff opportunities

- Using strategically placed cues within units to prompt delivery.
- Finding time to bring specialities within and across regional units together.
- Protecting time.
- Funding to backfill time and purchase necessary equipment.
- Access to a suite of adaptable resources.
- A diverse communications, engagement and events strategy.
- Tailored QI support and advice provision.
- PERIPrem Lead with a change mindset and strong leadership.

Thank you

We would like to thank all maternity, neonatal and obstetric staff across the South West for your continued dedication to implementing PERIPrem to improve outcomes for preterm babies and their families.

Thank you for contributing to this evaluation to enable us to understand the effectiveness of QI methodology in implementing PERIPrem, and to enable us to share learning with units elsewhere to support its spread.

Get in touch

The South West and West of England AHSNs are two of 15 AHSNs set up across the country by NHS England in 2013, to spread innovation in health and care.



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A Glover Williams, S Tuvey, H McBain, N Menzies, S Hedge, S Bates, K Luyt on behalf of the PERIPrem Steering Group. Perinatal Excellence to Reduce Injury in Preterm Birth (PERIPrem) through Quality Improvement. *BMJ Open Quality* (2022)

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