

Essentials of Safe Care

Safe Clinical & Care Processes

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Safe Clinical & Care Processes

The Preterm Bundle

Princess Royal Maternity, Glasgow











Background

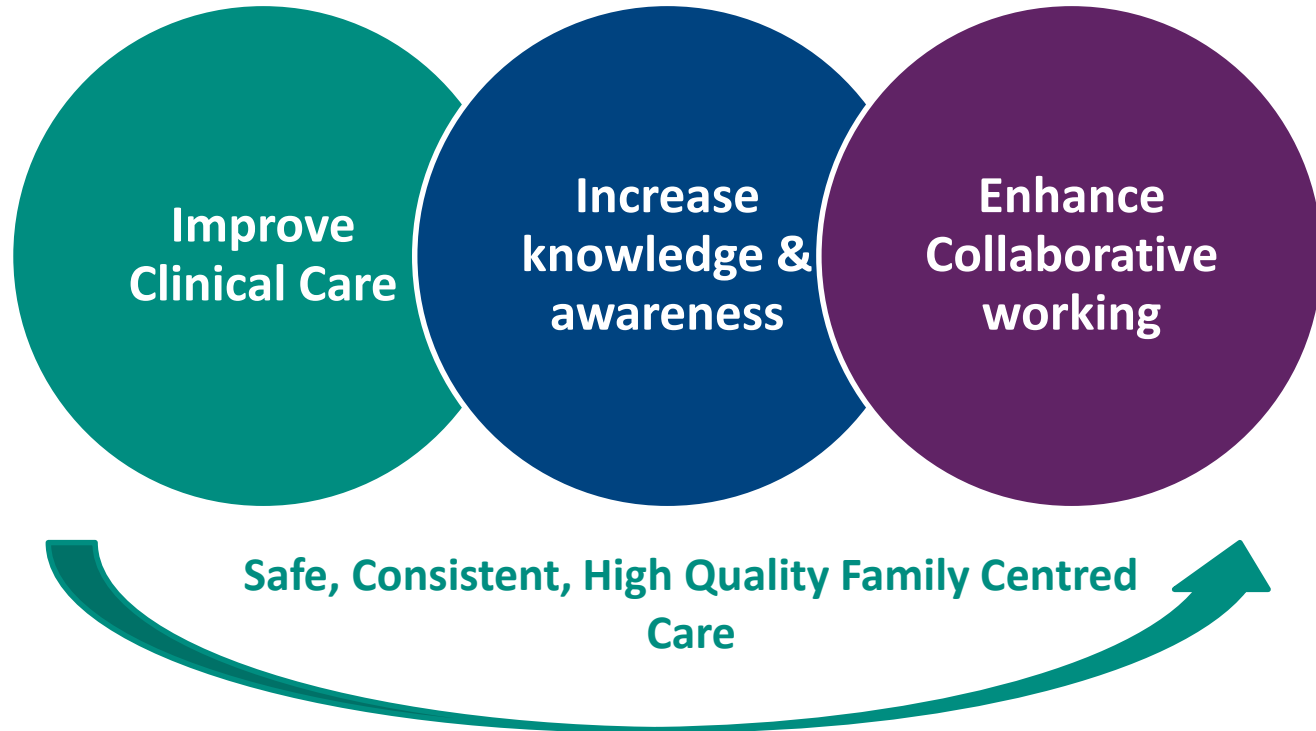
Perinatal optimisation relates to the delivery of the numerous evidence based antenatal, intrapartum and neonatal interventions that are vital in improving outcomes for preterm babies.




Preterm Perinatal Package

NICU  <27	Steroids  <1w <34	Magnesium  <24h <30	Cord Clamping  ≥60s
Temperature  <1h ≥36.5 ≤37.5 <32	Mum's Milk  <24h <32	Caffeine  <3d <27	<34w 


Aims of the Project



The Preterm Bundle



PRM PRETERM DELIVERY BUNDLE FOR <34 WEEKS



1. PREPARATION

TEAM HUDDLE

Allocate roles
Clarify delivery plan

EQUIPMENT

Resuscitaire
Facemask
Stethoscope
Laryngoscope
ET tube+/-introducer
Pedi-cap
ETT fixator
CPAP/VENTILATOR set up
+/-SURFACTANT

MONITORING

Philips X3 monitor
Saturation probe (right hand)
Continuous temp probe

THERMOREGULATION

Room temp _____ °C
Plastic bag (<32 weeks)
Warm Linen
Humidification
Incubators on pre-warm

CORD BLOODS GRAB BAG

2. PAUSE WITH OBSTETRICS

Baby Name _____

Date of Birth _____

Gestation _____ + _____

Time of Birth _____ : _____

Maternal CHI _____

Indications for delivery _____

Mode of Delivery _____

GBS/PROM YES ☐ NO ☐

• **ANTENATAL STEROIDS** Aim: FOR ALL BABIES, GIVEN WITHIN 1 WEEK OF BIRTH

Achieved: YES ☐ NO ☐

Last dose: ____/____/____ at ____:____ 1st dose ☐ 2nd dose ☐

• **MAGNESIUM SULPHATE** Aim: FOR ALL BABIES <30 WEEKS, GIVEN WITHIN 24 HOURS OF BIRTH

Achieved: YES ☐ NO ☐ N/A ☐

• **DEFERRED CORD CLAMPING** Aim: FOR ALL BABIES TO RECEIVE MINIMUM 60 SECONDS DCC

Achieved: YES ☐ NO ☐

Reasons if no OR if <60secs: _____

• **CORD BLOODS** Aim: ALL BABIES <30 WEEKS FOR ADMISSION BLOODS VIA CORD (2ml)

Achieved: YES ☐ NO ☐

3. POSTNATAL

• Respiratory support at birth SVIA ☐ CPAP ☐ Ventilation ☐

• Delivery Room Cuddle YES ☐ NO ☐ Duration _____ mins Well tolerated? YES ☐ NO ☐

Reasons if no cuddle _____

• Admission Temperature _____ °C (on arrival in transport incubator)

Blood sugar _____

• **CAFFEINE** Aim: ALL BABIES <30 WEEKS TO RECEIVE CAFFEINE <72 HRS OF AGE

Achieved: YES ☐ NO ☐

• **MEBM** Aim: FOR ALL BABIES <32 WEEKS TO RECEIVE MEBM WITHIN 24 HRS

Achieved: YES ☐ NO ☐

Education

PRETERM PERINATAL PACKAGE

A group of multidisciplinary interventions clinically proven to reduce morbidity and mortality, resulting in significantly improved outcomes for preterm babies.

NICU Delivery

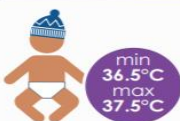


- Extreme preterm birth in a tertiary unit setting significantly improves survival and neurodevelopmental outcomes

AIM:

Optimally timed in-utero transfers should ensure infants **<27 weeks** are delivered in specialist tertiary neonatal units.

Maintain Temperature



- Early hypothermia (<36.5°C) increases mortality and risk of brain haemorrhage, NEC and sepsis
- Emerging evidence links early hyperthermia (>38°C) to adverse outcomes

AIM:

Ensure strict thermoregulatory measures to achieve normothermia (36.5 - 37.5°C) within an hour of birth.

Antenatal Steroids



- Reduces mortality by **32%**
- Reduces preterm lung disease, brain haemorrhage, necrotising enterocolitis (NEC) and sepsis

AIM:

All mothers delivering **<34 weeks** should receive a full course of steroids, ideally in the **7 days before birth**, for maximum efficacy.

Mum's Breast Milk



- Safest milk for preterm babies
- Significantly reduces the risk of sepsis and NEC
- Reduces mortality & improves neurodevelopmental outcomes

AIM:

All infants born **<32 weeks** should receive maternal milk, ideally within the **first 24 hours** of life.

Magnesium Sulphate



- Reduces risk of cerebral palsy by **30%**
- For every 37 women given magnesium sulphate, 1 less baby will develop cerebral palsy

AIM:

All mothers delivering **<30 weeks** should receive magnesium sulphate, ideally in the **24 hours before delivery** for maximum efficacy.

Early Caffeine



- Reduces apnoea, invasive ventilation and preterm lung disease
- Improves survival without neurodevelopmental disability

AIM:

All infants born **<30 weeks** should receive caffeine within 3 days, **ideally on admission** to NICU.

Deferred Cord Clamping



- Reduces mortality by **32%**
- Reduces brain haemorrhage
- Reduces the need for blood transfusion

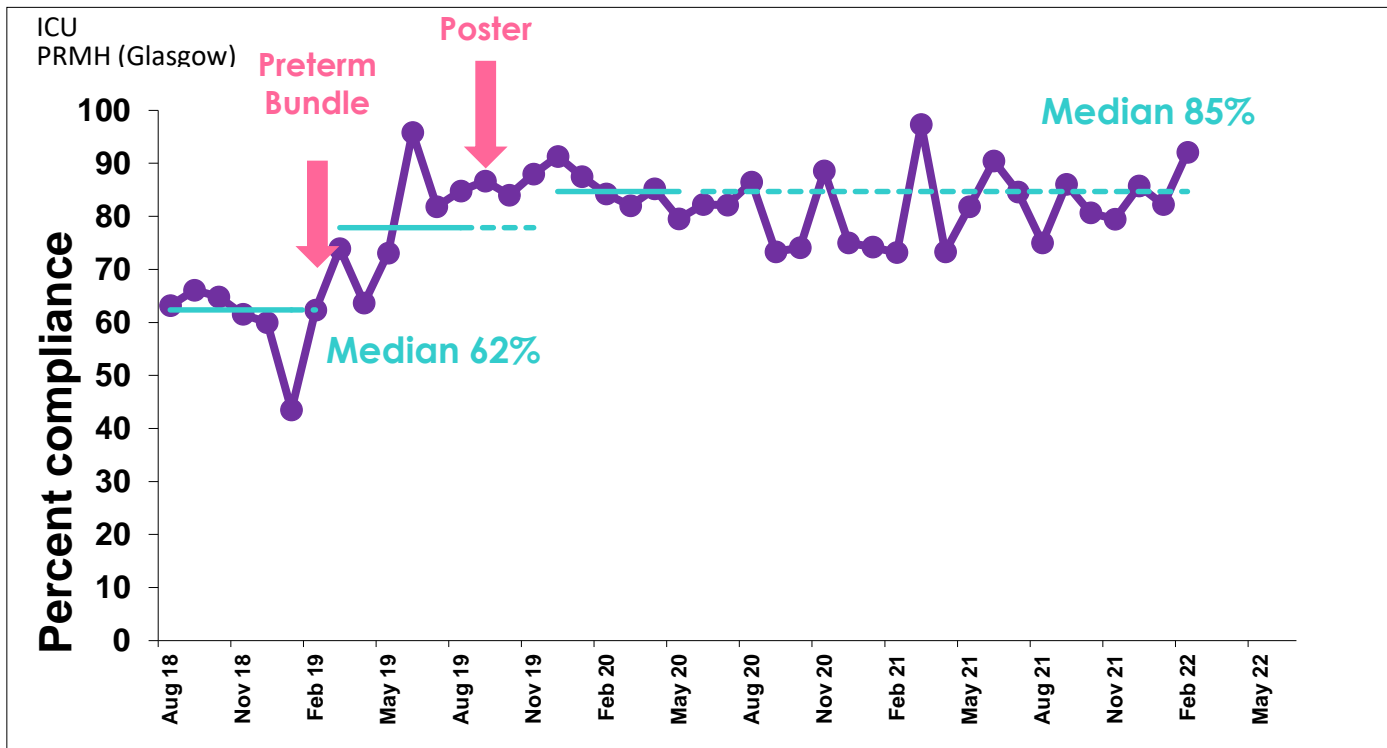
AIM:

To achieve these full benefits, all babies **<34 weeks** should receive deferred cord clamping of a **MINIMUM of 60 seconds**.

Produced by
Lynsey Sill and
Gemma Edwards for
NICU, NEC, team
in partnership with



Results: Package Compliance



Results:

STEROIDS



93%



97%

MAGNESIUM



63%



85%

CORD
CLAMPING

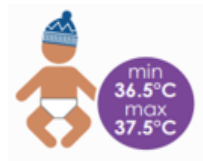


57%



80%

TEMP

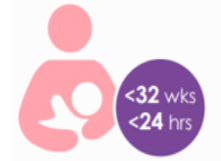


78%



85%

BREAST MILK



51%



60%

2018

2021

Scale Up & Spread

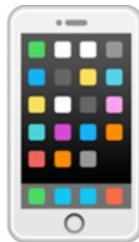
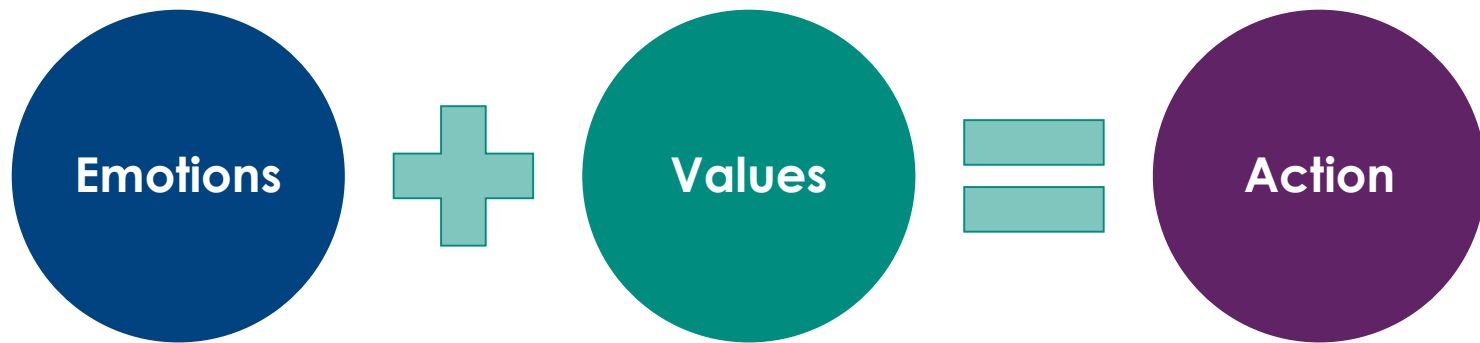
- Preterm Bundle is fully embedded as routine practice
- Adapted for use in sister units across Glasgow & shared with multiple units throughout UK
- Poster endorsed by MCQIC to share poster nationally with every maternity and neonatal unit across Scotland
- Evolution of National Preterm Bundle



Safe Clinical Care & Processes

Transferrable Learning

Education





Standardisation


The Preterm Bundle


NAME _____
GESTATION _____ + _____
DOB ____/____/____ TIME OF BIRTH ____ : ____

ANTENATAL

PLACE OF BIRTH: ALL BABIES <27 WKS SHOULD DELIVER IN
A TERTIARY LEVEL NICU YES [] NO [] 


ANTIBIOTICS: FOR ALL WOMEN IN ESTABLISHED PRETERM
LABOUR YES [] NO [] 

STEROIDS: FOR ALL WOMEN <34 WKS & WITHIN 7 DAYS
OF DELIVERY YES [] NO [] 


MAGNESIUM: FOR ALL WOMEN <30 WKS & WITHIN 24HRS
OF DELIVERY YES [] NO [] 

COUNSELLING: IMPORTANCE OF EBM YES [] NO []
NEONATAL TEAM YES [] NO []

STABILISATION

DCC: MINIMUM OF 60 SECONDS YES [] NO []
CONTRAINDICATIONS TO DCC YES [] NO [] 

RESPIRATORY: GENTLE LUNG INFLATION IF REQUIRED 20-25cm H₂O
AIM TO ESTABLISH CPAP 6-8cm <5 MINS OF AGE
INTUBATION IF PERSISTENT APNOEA/BRADYCARDIA
SURFACTANT 200MG/KG IF INTUBATED FOR STABILISATION
VOLUME LIMITED STRATEGY FIRST LINE



TEMP: CONTINUOUS TEMP MONITORING YES [] NO []
TEMP LEAVING LW _____ °C 
TEMP ON ARRIVAL TO NICU _____ °C

MATERNAL CHI _____
INDICATION FOR DELIVERY _____
RF FOR SEPSIS YES [] NO []

PREPARATION & PAUSE

UNIT PREP: COTSPACE, VENTILATOR, LINE TROLLEYS, PN, LIPID, DRUGS
ALLOCATE ROLES: AIRWAY, CIRCULATION, MONITORING, TEMP
EQUIPMENT: RESUSCITAIRE, FIO₂ <28 WKS 30% >28 WKS 21-30%,
PLASTIC BAG, AIRWAY, SURFACTANT, MONITORING
MEASURING TAPE OFC _____ cm
TRANSPORT INCUBATOR
MDT PAUSE: DELIVERY INTO PLASTIC BAG IF <32 WKS
DEFERRED CORD CLAMPING FOR MINIMUM 60 SECS
CORD BLOODS
PLAN FOR DELIVERY ROOM CUDDLE

NICU ADMISSION

PAUSE: ALLOCATION OF ROLES
IV ACCESS: PVC/UAC/UVIC
FLUIDS: <30 WEEKS PN @90ML/KG/DAY, LIPID @2G
DRUGS: CAFFEINE ALL BABIES <30 WKS YES [] NO [] 
ANTIBIOTICS IF RF FOR SEPSIS YES [] NO []
MEBM: MATERNAL EBM FOR ALL BABIES <32 WKS WITHIN 24 HRS
OF BIRTH YES [] NO [] 
CRANIAL US: <32 WKS, IF NORMOTHERMIC & STABLE
RESEARCH: ELIGIBLE FOR TRIAL? YES [] NO []
PARENTS: DATE & TIME OF SENIOR UPDATE ____/____/____ @ ____:____

- QI tools & resources to help your teams
- All patients to receive the same gold standard of care
- If not, why not?

Standardisation

The Preterm Bundle

NAME _____
GESTATION _____+_____
DOB ____/____/____ TIME OF BIRTH ____ : ____

MATERNAL CHI _____
INDICATION FOR DELIVERY _____
RF FOR SEPSIS YES [] NO []

ANTENATAL

PLACE OF BIRTH: ALL BABIES <27 WKS SHOULD DELIVER IN A TERTIARY LEVEL NICU YES [] NO []

ANTIBIOTICS: FOR ALL WOMEN IN ESTABLISHED PRETERM LABOUR YES [] NO []

STERIODS: FOR ALL WOMEN <34 WKS & WITHIN 7 DAYS OF DELIVERY YES [] NO []

MAGNESIUM: FOR ALL WOMEN <30 WKS & WITHIN 24HRS OF DELIVERY YES [] NO []

COUNSELLING: IMPORTANCE OF EBM YES [] NO []
NEONATAL TEAM YES [] NO []

STABILISATION

DCC: MINIMUM OF 60 SECONDS YES [] NO []
CONTRAINDICATIONS TO DCC YES [] NO []

RESPIRATORY: GENTLE LUNG INFLATION IF REQUIRED 20-25cm H₂O
AIM TO ESTABLISH CPAP 6-8cm <5 MINS OF AGE

TEMP: CONTINUOUS TEMP MONITORING YES [] NO []
TEMP LEAVING LW _____°C
TEMP ON ARRIVAL TO NICU _____°C

PREPARATION & PAUSE

UNIT PREP: COTSPACE, VENTILATOR, LINE TROLLEYS, PN, LIPID, DRUGS

ALLOCATE ROLES: AIRWAY, CIRCULATION, MONITORING, TEMP

EQUIPMENT: RESUSCITAIRE, FIO₂ <28 WKS 30% >28 WKS 21-30%, PLASTIC BAG, AIRWAY, SURFACTANT, MONITORING MEASURING TAPE OFC _____cm
TRANSPORT INCUBATOR

NOT PAUSE: DELIVERY INTO PLASTIC BAG IF <32 WKS
DEFERRED CORD CLAMPING FOR MINIMUM 60 SECS
CORD BLOODS
PLAN FOR DELIVERY ROOM CUDDLE

NICU ADMISSION

PAUSE: ALLOCATION OF ROLES

IV ACCESS: PVC/UAC/LWC

FLUIDS: <30 WEEKS PN @90ML/KG/DAY, LIPID @2G

DRUGS: CAFFEINE ALL BABIES <30 WKS YES [] NO []
ANTIBIOTICS IF RF FOR SEPSIS YES [] NO []

MERM: MATERNAL EBM FOR ALL BABIES <32 WKS WITHIN 24 HRS OF BIRTH YES [] NO []

CRANIAL US: <32 WKS, IF NORMOTHERMIC & STABLE

RESEARCH: ELIGIBLE FOR TRIAL? YES [] NO []

PARENTS: DATE & TIME OF SENIOR UPDATE ____/____/____ @ ____:

- Visual
- Consistent messaging
- Clear communication with teams
- Easy to use & follow

Preterm Bundle Monthly Summary

Our Compliance with the PPWP

February 2022

Total number of babies born <34 weeks

10

Gestation No. of Babies

< 27 weeks

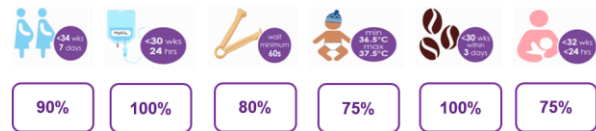
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27 – 29+6

2

30 – 33+6

6



Proportion of babies achieving full perinatal optimisation

80%

Proportion of all optimisation interventions given

92%

Think About Your Team...

