SPSP Perinatal and Scottish Perinatal Network Webinar

The Perinatal Approach to Extreme Preterm Births

24 January 2024

Chair’s Welcome

Lynsey Still

SPSP Perinatal Neonatal Clinical Lead

Healthcare Improvement Scotland

Agenda

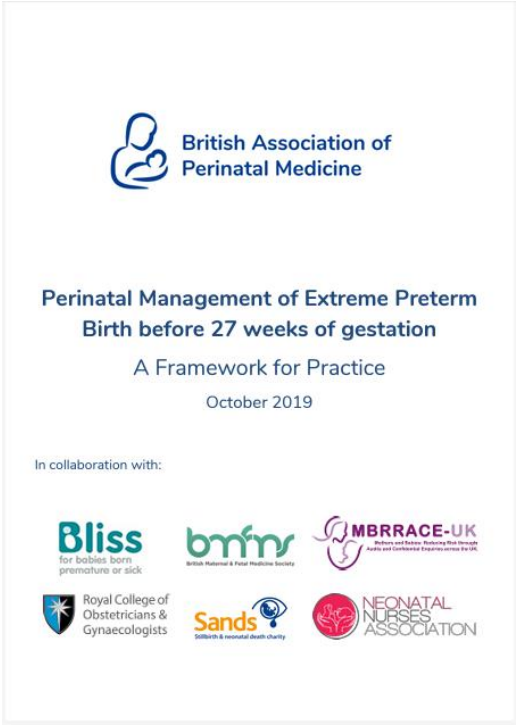
Time	Topic	Lead
12:30-12:35	Welcome and aims of the webinar	Lynsey Still, SPSP Perinatal Neonatal Clinical Lead, Healthcare Improvement Scotland Lesley Jackson, SPN Neonatal Clinical Lead
12:35-12:40	SPSP Perinatal and SPN – how we're supporting improving perinatal outcomes in Scotland	Tara Fairley, SPN Obstetrics Clinical Lead Nirmala Mary, SPSP Perinatal Obstetric Clinical Lead, Healthcare Improvement Scotland
12:40-13:00	Births at 22 weeks – The Scottish Experience	Sarah Farquharson, Neonatal Registrar, PRM
13:00-13:10	Learning from pre-term birth clinics	Gail Littlewood, Consultant Obstetrician
13:10-13:20	Overview of new Scottish guidance on extreme preterm births	David Quine, Consultant Neonatologist, Co-chair NNN Guideline Oversight Group
13:20-13:25	How SPSP Perinatal can support quality improvement in your unit	Jo Thomson, Senior Improvement Advisor, Healthcare Improvement Scotland
13:25-13:50	Panel Q&A and questions to speakers	
13:50-14:00	Summary and link to resources	Lynsey Still, SPSP Perinatal Neonatal Clinical Lead, Healthcare Improvement Scotland

Aims of the webinar

- Share key themes from national learning of extreme preterm births at 22 weeks gestation across Scotland
- Provide an overview of new Scottish neonatal guidance on extreme preterm births
- Discuss learning from preterm birth clinics
- Describe how the SPSP Perinatal programme and Scottish Perinatal Network can support teams to optimise outcomes for extreme preterm babies

Setting the Scene

- Publication of BAPM updated Framework, October 2019
- Major shift in perinatal practice in the most extreme preterm babies
- Local reviews revealed key themes with poor outcomes
- Appropriate to review the Scottish experience to date



Setting the Scene

- Collaboration between the Scottish Perinatal Network and SPSP Perinatal Programmes, promoting collaborative perinatal working at all levels

- Presentation of key themes from clinical cases of births at 22 weeks
  - Small numbers
  - Informed the format of todays webinar
  - Request not to post on social media

- Providing a safe space to share and learn together
  - Reflect and drive service improvements across services

SPSP Perinatal and SPN – how we're supporting improving perinatal outcomes in Scotland

Tara Fairley

SPN Obstetrics Clinical Lead

Nirmala Mary

SPSP Perinatal Obstetric Clinical Lead

Neonatal mortality and morbidity

2023 Perinatal Driver Diagram

What we are trying to achieve…	We need to ensure…	Which requires…
Reduce Neonatal Mortality and Neonatal Morbidity by: - *Reducing complications of prematurity* - *Reducing late preterm and unexpected term admissions to NNU* *By [locally agreed aim]* *By 31st March 2025*	Person centred care* considers the Continuity of Carer approach	Women / birthing people and families are listened to and included in care decisions Person centred care planning Family centred approach with a focus on reducing separation Inclusive care pathways which provide equitable and culturally appropriate access and treatment
	Reduction in preterm birth	Screening to identify woman / birthing person at high-risk of preterm birth Clear pathways to ensure ease of access for women / birthing people and families to maternity services Safe clinical and care processes*
	Delivery of evidence based preterm care	Perinatal optimisation Reliable delivery of evidence based interventions Collaborative perinatal team working
	Reduction of avoidable term and late preterm admissions	Avoidance of elective births before 39 weeks unless medically indicated Risk assessment, appropriate monitoring and escalation in labour Delivery of evidence based care to optimise postnatal transition Recognition, response and escalation of deterioration
	Leadership to promote a culture of safety at all levels*	Psychological safety Staff wellbeing System for learning Safe staffing

*Essentials of Safe Care

https://ihub.scot/improvement-programmes/scottish-patient-safety-programme-spsp/spsp-perinatal/

SPSP Perinatal: Data & Reporting

Scottish Perinatal Network

Healthcare Improvement Scotland

Scottish Patient Safety Programme

	Perinatal Measures	Existing measure?
1	Rate of stillbirths	✓
2	(MEWS) charts compliance	✓
3	MEWS chart escalation pathway	✓
4	Rate of PPH – over 1.5 litre	New (prev 2.5)
5	Maternity admissions to ITU (balancing measure)	New
6	Rate of Neonatal Deaths	N/A
7	Rate of pre term birth	N/A
8	Clinical Outcomes Composite measure (NNAP)	✓
9	Rate of term admissions to Neonatal Unit	✓
10	Percentage compliance with PPWP	✓
11	Caesarean births - completeness of Robson criteria data	New

National pathway for In-Utero Transfers in Scotland
Developed under the SPN Transport Group

- The outcome following birth of a sick and/or preterm infant is improved if birth occurs in a unit staffed and equipped to provide the required level and type of neonatal care. In utero transfer is safer than neonatal transfer. This applies particularly to infants of extreme pre-term gestation.
- The aim was to develop guidance for Scotland to improve the process around IUT.
- This includes risk assessments for the quantitative prediction of pre-term birth (utilising the QuiPP app), guidance around when transfer is and isn't indicated, a centralised process for organising the logistics of transfer and guidance on pre-birth optimisation.
- Group membership included mulitprofessional colleagues from both referring and receiving units and SAS/ScotSTAR colleagues. The pathway was published in March 2023 and has been well received. We will continue to evaluate the pathway and adjust this in response to feedback from colleagues and service users.

Birth at 22 weeks
The Scottish Experience

Dr Sarah Farquharson

ST6 Neonatal Registrar

Methods

- Retrospective case review of babies born at 22 weeks from 1st October 2019 to 1st January 2024
- Babies identified using Badgernet™
- Use of standardised template for data collection
- Data collected by colleagues across Scottish neonatal units

Methods

Included: Babies alive at the onset of labour at 22+0 to 22+6 weeks

Excluded: Uncertain gestation
Intrauterine deaths prior to onset of labour at 22 weeks
Termination of pregnancy resulting in birth at 22 weeks

Primary Outcome: Survival to discharge

Secondary Outcome: Maternal antenatal planning, counselling, optimisation, resuscitation and neonatal outcomes

Overview

Babies born at 22^{+0} - 22^{+6} weeks across Scotland

Total 43 babies

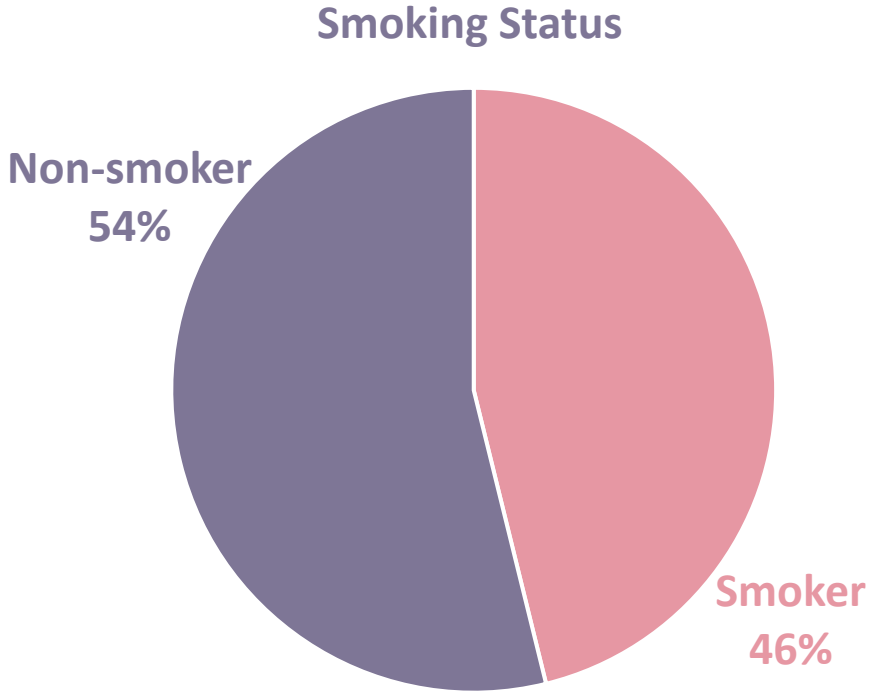
Maternal Demographics

Maternal Age at Booking

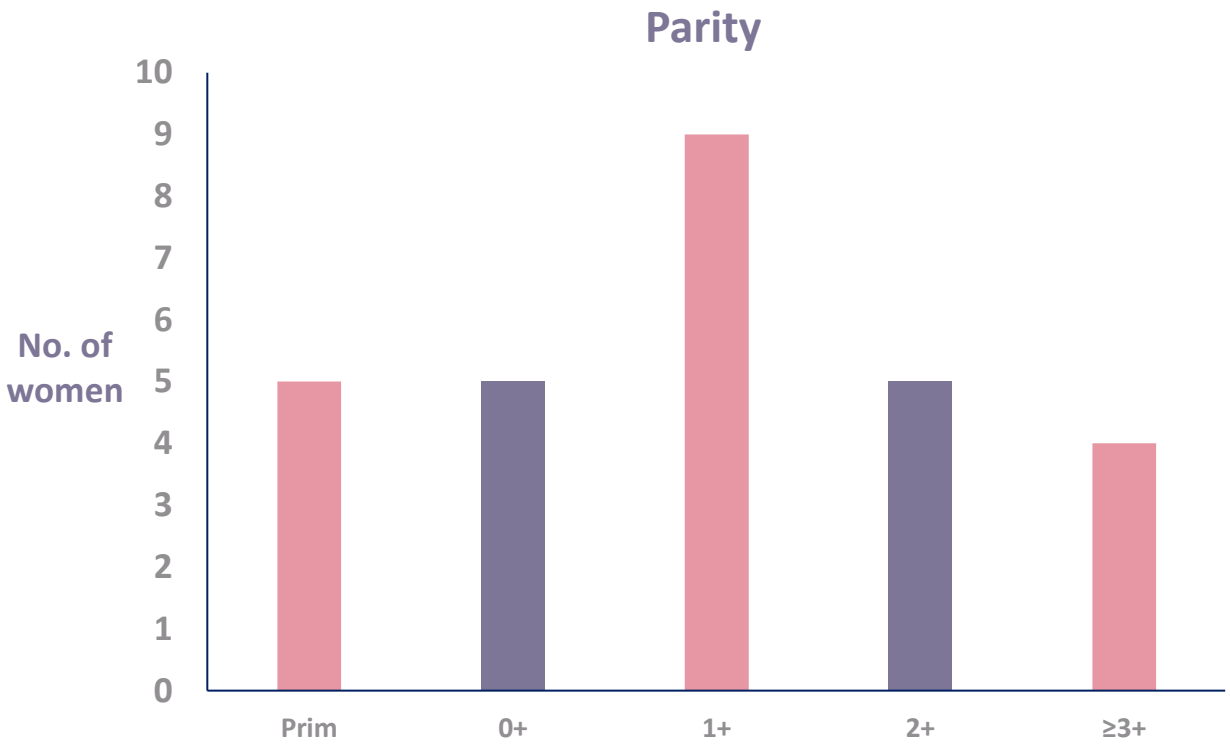
- Range: 18-41 years
- Median: 31 years

Ethnicity

• White Scottish	71%
• White Other	14%
• African	3%
• Pakistani	7%
• Other	5%

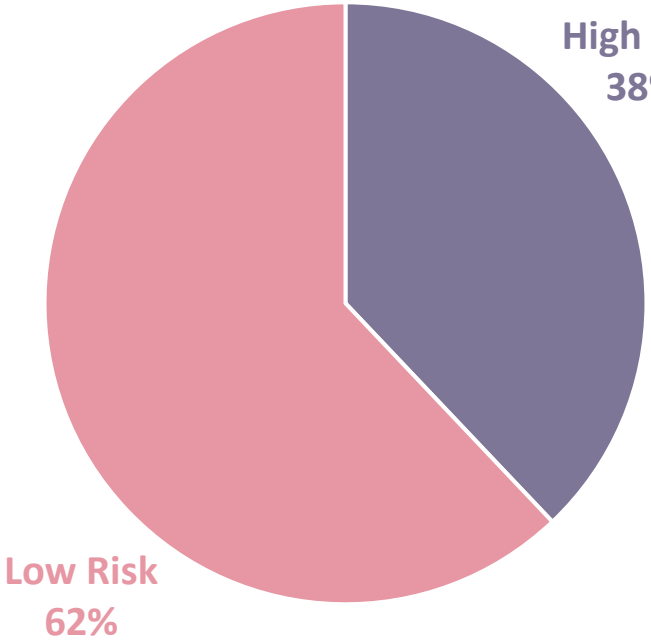


Maternal Demographics



All singleton pregnancies

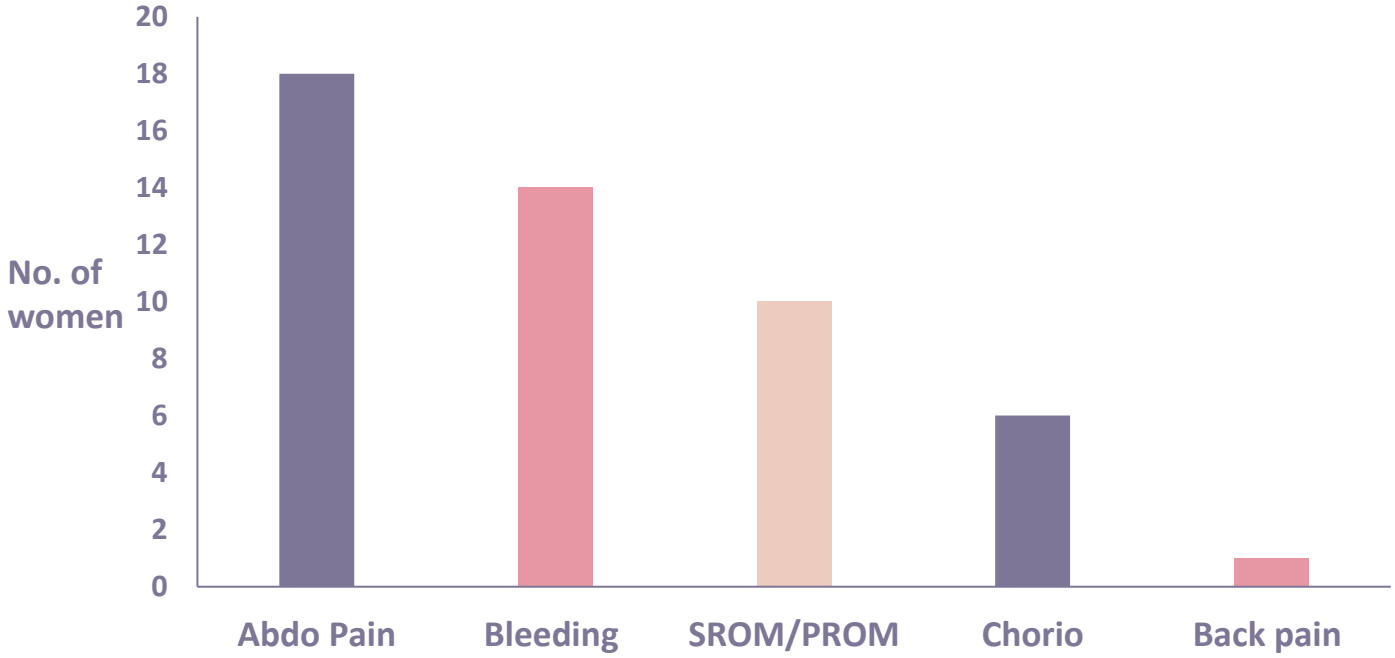
Risk Factors for PTB



- Cervical Insufficiency* 20%
- Fibroids 3.5%
- Previous preterm birth 10%
- Previous stillbirth 3.5%
- Low PAPP-A 3.5%

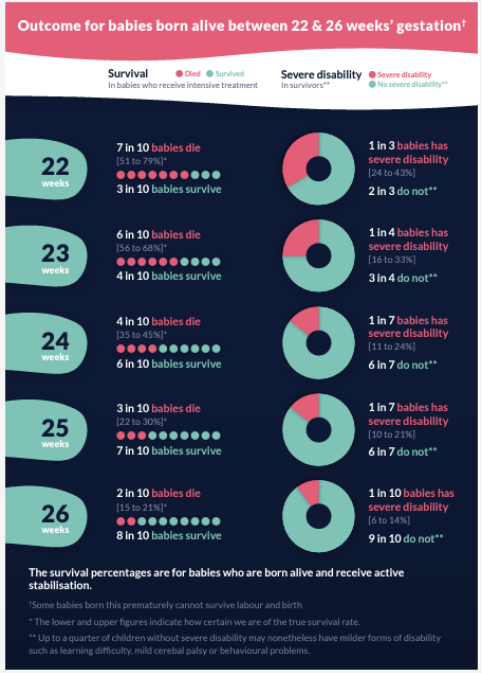
*1 (3.5%) patient had planned cervical length measurements made at booking

Presenting Symptoms

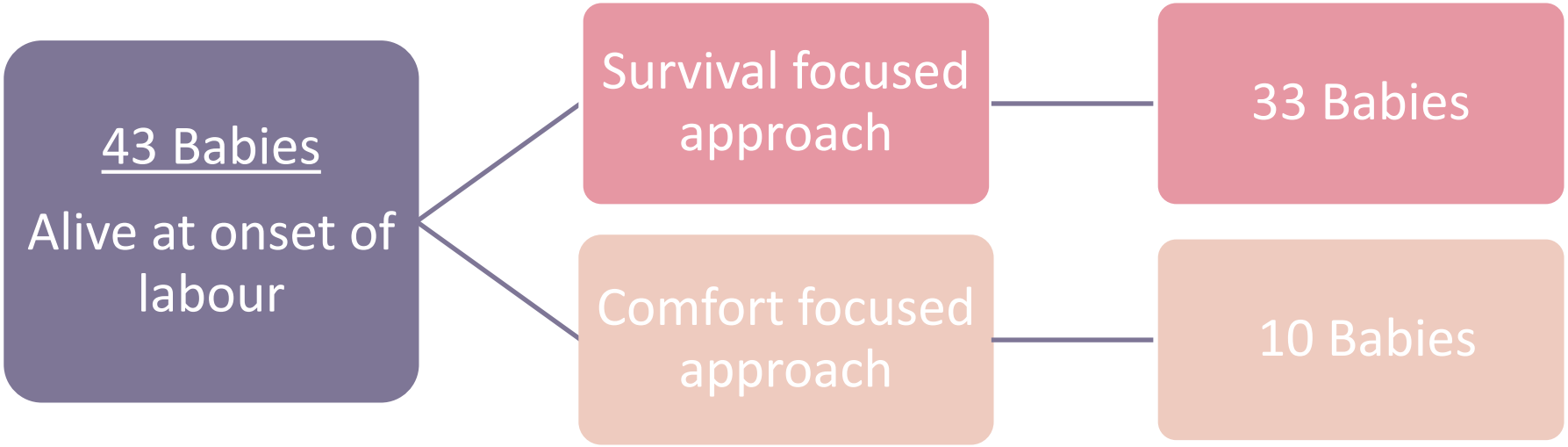


Antenatal Counselling

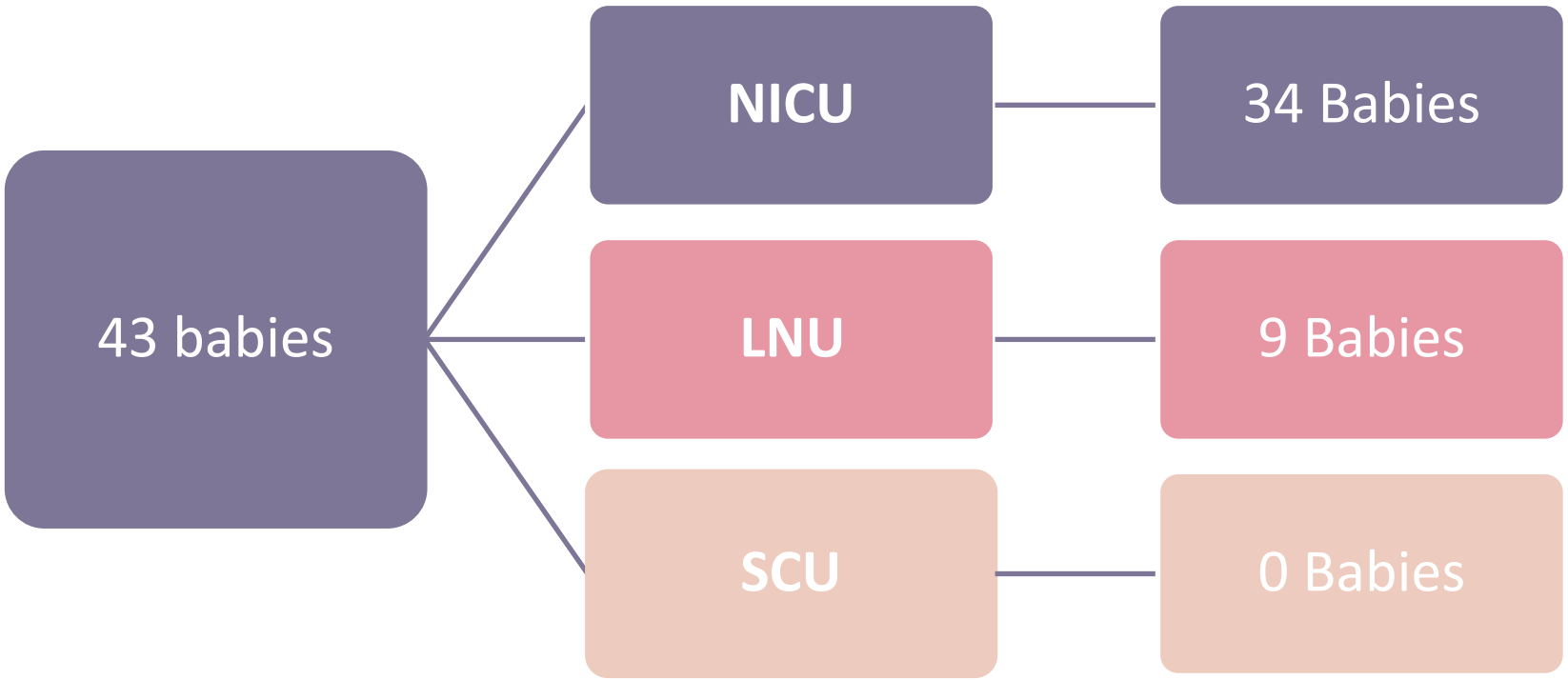
- Obstetric counselling — 66% of patients
- Neonatal counselling — 66% of patients
- Joint counselling — 7% of patients



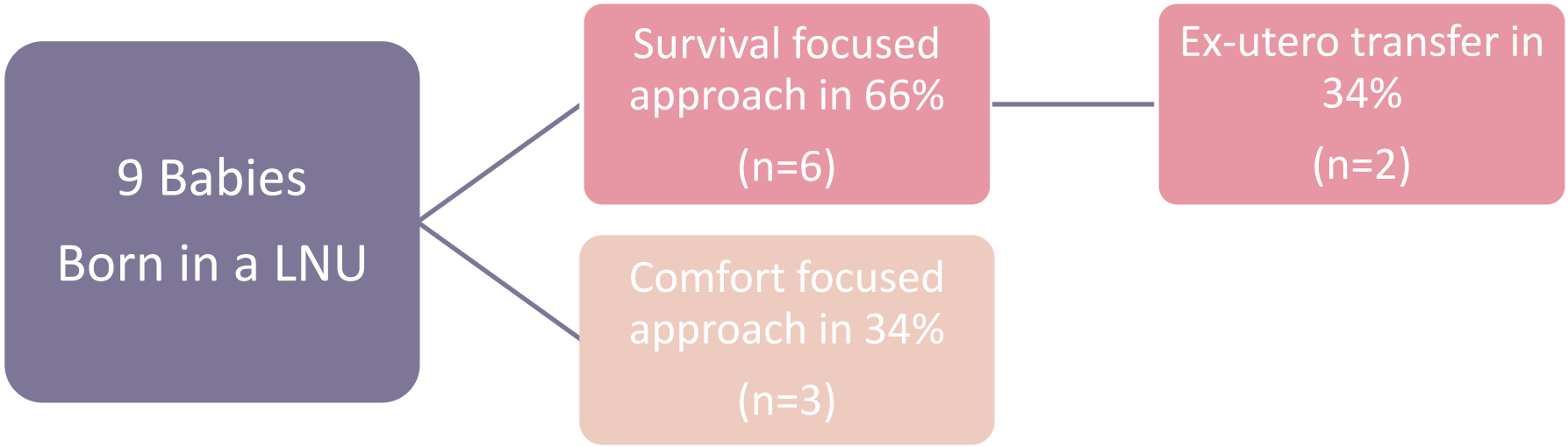
Overview


43 Babies
Alive at onset of labour
Survival focused approach
33 Babies
Comfort focused approach
10 Babies

Place of Birth



Place of Birth



Optimisation

PLACE OF BIRTH

Birth in NICU
in 79%

STEROIDS

Full course
33%

Incomplete
18 %

No steroids
49 %

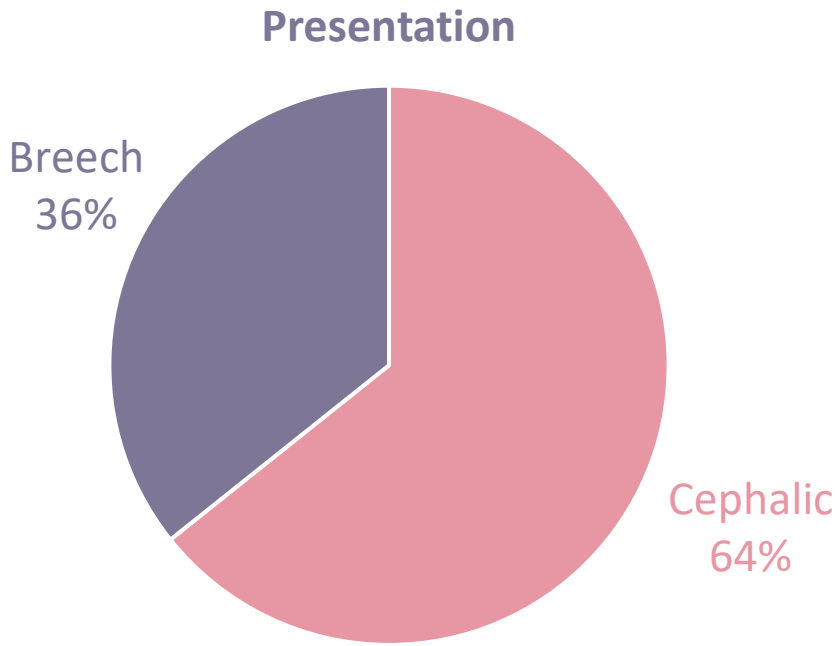
MAGNESIUM

Any $MgSO_4$
40 %

No $MgSO_4$
60 %

Birth

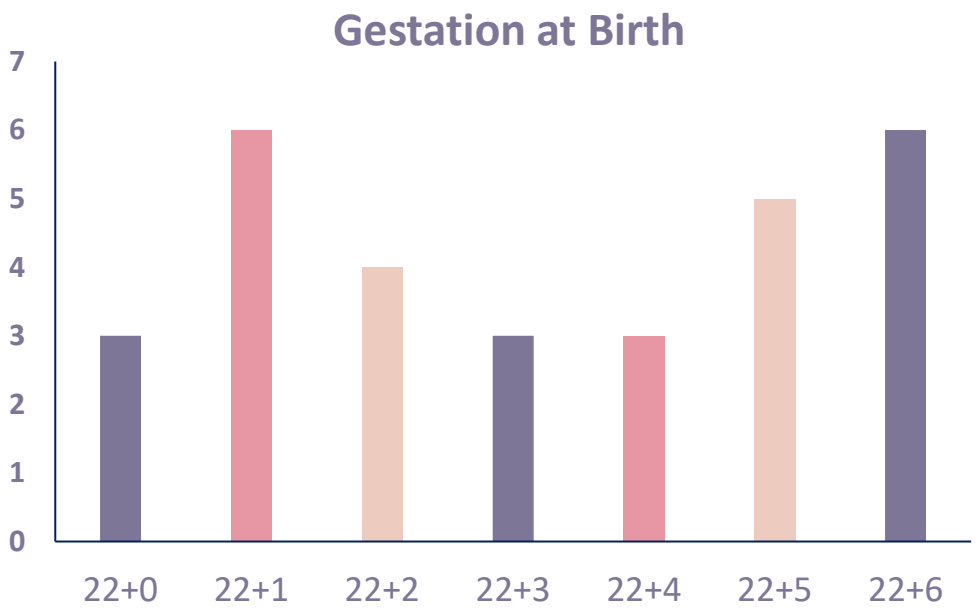
All babies born via spontaneous vaginal birth

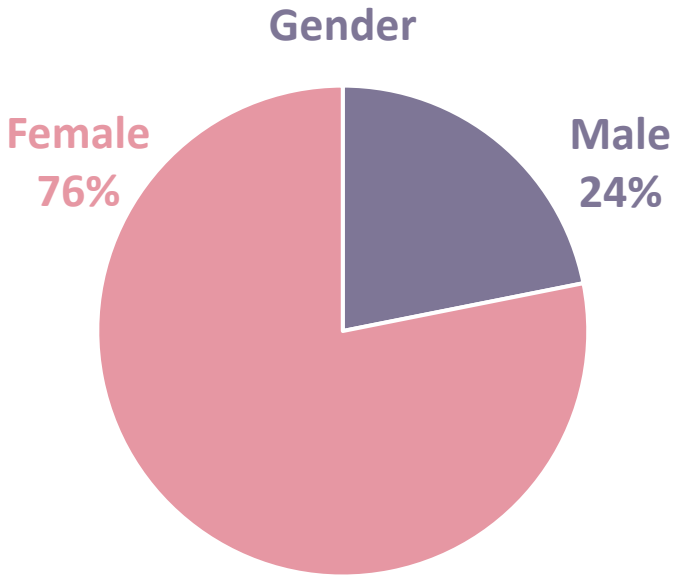


- Consultant obstetrician present at time of birth in 85% of cases
- Consultant neonatologist present at time of birth in 60% of cases

Baby Demographics

Birth Weight: Range 320g - 620g;
Median 470g





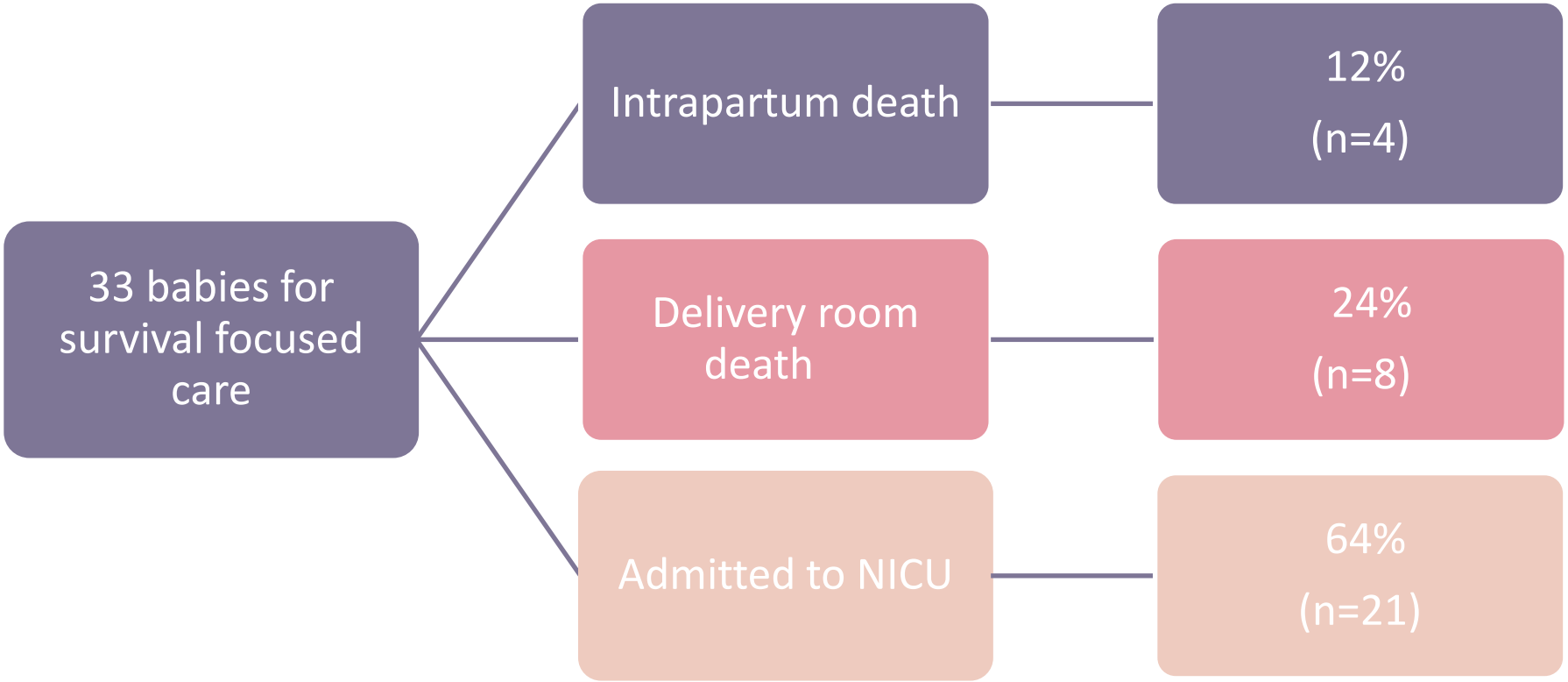
Stabilisation & Resus

Born with signs of life:		88%
Resuscitation:	- No resuscitation	15%
	- IPPV	85%
	- Intubation	74%
	- CPR	7.5%
	- Drugs	0%
	- Length	2-45 mins

DCC

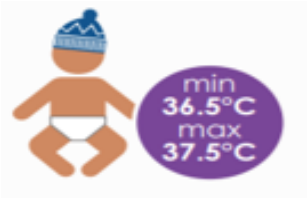
45%

Delivery Room Outcomes



NICU Admissions

ADMISSION TEMPERATURE

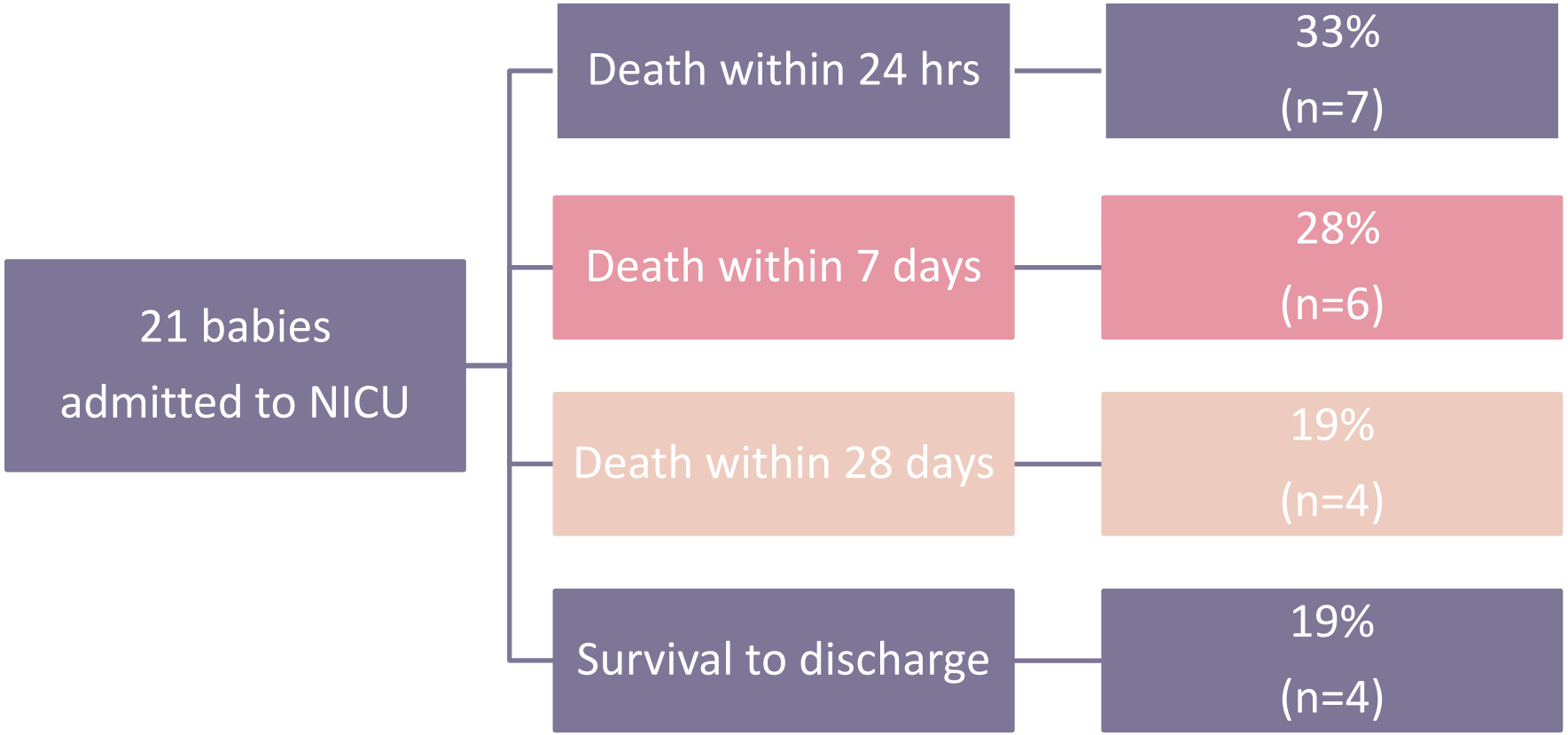


40%
Normothermic

52% Cold

8% Hot

Outcomes


21 babies admitted to NICU
Death within 24 hrs
33% (n=7)
Death within 7 days
28% (n=6)
Death within 28 days
19% (n=4)
Survival to discharge
19% (n=4)

Morbidities

Short Term:

- Hypoxic respiratory failure
- Intraventricular haemorrhage grade 3/4
- Pulmonary haemorrhage
- Pneumothorax

Medium Term:

- Sepsis
- NEC
- Chronic Lung Disease
- PDA
- Retinopathy of Prematurity (requiring treatment)

Main Cause of Death

- Extreme prematurity 52%
- Hypoxic respiratory failure 17%
- Pulmonary Haemorrhage 13%
- Intracranial haemorrhage 10%
- NEC 4%
- Multi-organ failure 4%

Pathology

- No post-mortem examinations carried out in any babies
- Themes within placental pathology:
  - Majority of cases consistent with acute chorioamnionitis
  - Smaller number had features of placental abruption
  - Some with co-existent chorioamnionitis and abruption

Long Term Outcome

- Limited data on small group of babies (n=4)
- Themes within group
  - Born in NICU, optimised with steroids, magnesium and DCC
- Long term outcome good
  - Normal gross and fine motor function
  - Attention difficulties

Overall

Of 33 babies for survival focused care

Survival to discharge 12%

(n=4)

Long term survival and outcome data to follow

Key Themes

Maternal

- Mostly parous women
- Majority present with cramping abdominal pain +/- bleeding
- Commonly present late and progress rapidly
- Chorioamnionitis plays a key triggering role

High Risk Patients

- Risk factors for preterm birth in almost 40%
- Most women with cervical insufficiency did not have cervical length screening

Key Themes

Counselling

- Full counselling not always being achieved
- Very few families being jointly counselled to ensure maternal and fetal interests being considered together

Optimisation

- Low optimisation rates across all areas
- Recognition and diagnosis of preterm labour makes this particularly challenging
- Definite opportunities for improvement

Key Themes

Neonatal

- Hypoxic respiratory failure the most frequently early morbidity
- Bleeding complications common – intracranial and pulmonary

Overall:

- Only babies born in a NICU have survived to discharge thus far
- Survival rates of babies born at 22 weeks across Scotland are low – 12%
- Areas for improvement identified throughout the perinatal journey

Limitations

- Challenges in identifying babies through Badgernet due to definitions, signs of life and location of death
    - Intrapartum deaths and stillbirths
    - Delivery room deaths
    - Neonatal deaths

- Collecting full and accurate data is restricted dependent on level of detail documented, and is not always clear from limited notes

- More detailed and contemporaneous data collection is required

Going forward

- Scotland is still early in experience of management mothers and babies delivering at 22 weeks
- Limited literature on this unique group of babies but our expertise will grow and more evidence base guidance will emerge
- For now we need to ensure greater perinatal team working and robust data collection for this unique group of babies
- We must prioritise ongoing learning, with regular review of cases locally and nationally to identify themes and areas for focus and improvement

Acknowledgements

A huge thank you to all those who contributed to data collection:

- Dr Tim Adams
- Emma Allan
- Dr Andrew Eccleston
- Dr Laura Stewart, Julie Steele
- Dr Dominic O'Reilly
- Dr Ahmed Afifi
- Dr Sarah Farquharson & Dr Lynsey Still
- Dr Elaine Balmer & Dr Niall Donaldson
- Dr David Quine & Dr Deepa Patil
- Dr Lauren Shaw
- Dr Philine Van Der Heide

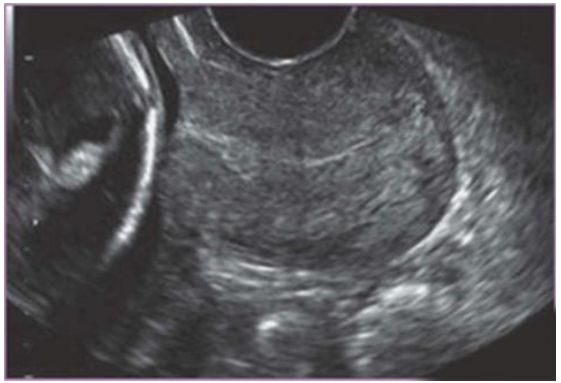
NHS Ayrshire and Arran
NHS Borders
NHS Dumfries & Galloway
NHS Fife
NHS Forth Valley
NHS Grampian
NHS Greater Glasgow & Clyde
NHS Lanarkshire
NHS Lothian
NHS Tayside
NHS Highland

Learning from preterm birth clinics

Dr Gail Littlewood

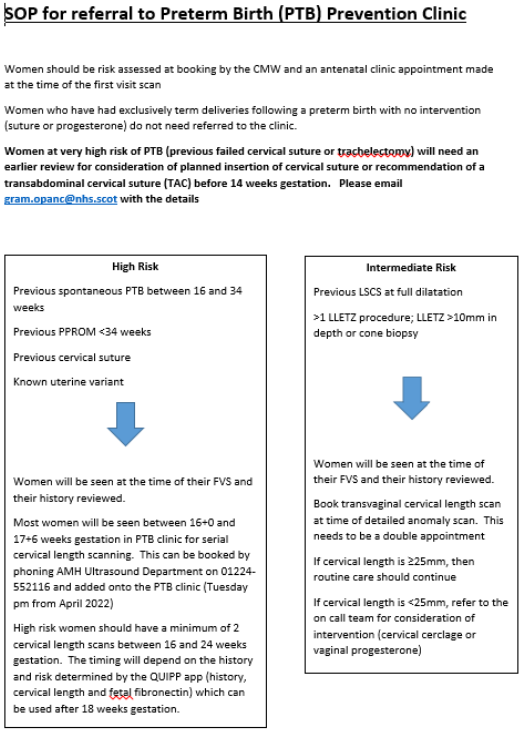
Consultant Obstetrician

NHS Grampian



Preterm Birth Prevention Clinic

- Started April 2022
- Based on Reducing Preterm Birth Guidance, UK Preterm Clinical Network, 2019
- Aim was to standardise the care of these women and develop local expertise in management



SOP for referral to Preterm Birth (PTB) Prevention Clinic

Women should be risk assessed at booking by the CMW and an antenatal clinic appointment made at the time of the first visit scan

Women who have had exclusively term deliveries following a preterm birth with no intervention (suture or progesterone) do not need referred to the clinic.

Women at very high risk of PTB (previous failed cervical suture or trachelectomy) will need an earlier review for consideration of planned insertion of cervical suture or recommendation of a transabdominal cervical suture (TAC) before 14 weeks gestation. Please email gram.opanc@nhs.scot with the details

High Risk

Previous spontaneous PTB between 16 and 34 weeks

Previous PPROM <34 weeks

Previous cervical suture

Known uterine variant

Women will be seen at the time of their FVS and their history reviewed.

Most women will be seen between 16+0 and 17+6 weeks gestation in PTB clinic for serial cervical length scanning. This can be booked by phoning AMH Ultrasound Department on 01224-552116 and added onto the PTB clinic (Tuesday pm from April 2022)

High risk women should have a minimum of 2 cervical length scans between 16 and 24 weeks gestation. The timing will depend on the history and risk determined by the QUIPP app (history, cervical length and fetal fibronectin) which can be used after 18 weeks gestation.

Intermediate Risk

Previous LSCS at full dilatation

>1 LLETZ procedure; LLETZ >10mm in depth or cone biopsy

Women will be seen at the time of their FVS and their history reviewed.

Book transvaginal cervical length scan at time of detailed anomaly scan. This needs to be a double appointment

If cervical length is ≥25mm, then routine care should continue

If cervical length is <25mm, refer to the on call team for consideration of intervention (cervical cerclage or vaginal progesterone)

What works well?

- Formalising the referral pathway
  - Previously appointments were made for cervical length scans too early and without adequate time for sonographers to do the scan/write report/prepare room
- Continuity over serial scans to see changes developing
  - We have seen changes in the cervix such as fluid within canal, tearing of a suture and funnelling onto a suture which allows additional management to be put in eg, antibiotics or second suture
- Support for families

Team communication

- Weekly high risk obstetric/neonatal meeting
- Repeat discussions with neonatal team if at extremes of viability
- External opinion

Challenges

- Identifying all women ie, previous full dilatation sections
- Differentiating reason for PTB
- National shortage of quantitative fibronectins
- Local geography

Future plans

- Current QI project ongoing looking at outcome of cervical sutures
  - Wish to review outcome of general population
- Continued experience with TAC sutures
- Improvement in follow up of women who have had preterm birth to discuss events and provide plan for next pregnancy
- Ongoing training (new RCOG SITM – Care for Prematurity)

National Guidance on Management Extreme Preterm Infants

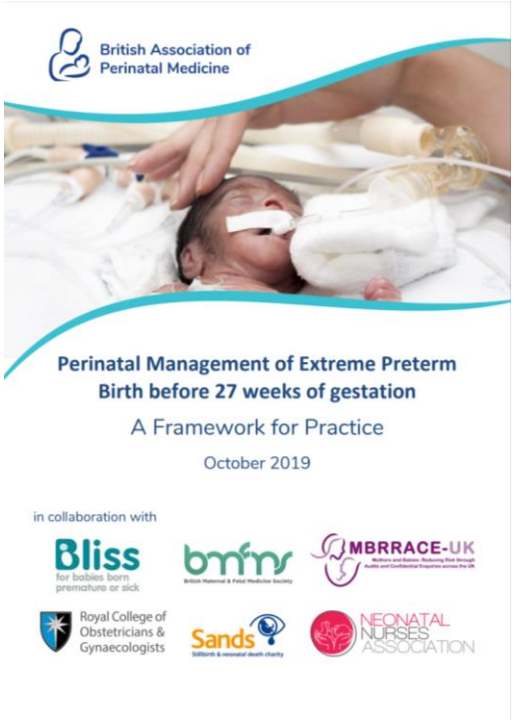
Dr David Quine

Neonatologist

Edinburgh

Short Life Working Group-2021 (Nov)

- Suddenly looking after 22 week gestation infants from late 2019
- In Lothian we had already started auditing and learning from looking after infants of both 22 and 23 weeks gestation-I had been working on a list of potentially better practices that would support these infants
- Raised nationally at our National Neonatal Guidelines steering group-I agreed to chair the group.



- 2018-2022 data (5 Years):
- 50% of 22 week gestation infants parents have opted for survival focused care
- Only 14 % of 23 week gestation infants parents have opted for Palliative care

National Neonatal Network Guideline

Management of Extreme Preterm Infants (22+0 to 23+6 weeks)

8 became 9

1. Network Principles
2. Antenatal Communication and Maternal / Neonatal Transport
3. Delivery Room, Early NNU, Golden Hours and Access
4. Respiratory Management
5. Cardiovascular and Haemodynamics
6. Fluids and Nutrition
7. Infection Prevention and Skin Care
8. Neuro-Critical
9. Family centred support (including palliative care) and neonatal team support

Target Infants

- Infants 22+0 to 23+6
- Main lessons-
  - Be very conscientious / meticulous / painstaking
  - Consultant lead reviews 6-8 hourly

Network principles

- Best start model-three Scottish NICU's
- In-utero or ex-utero transfers to these NICU's
- Capacity prioritisation / Repatriation pathways
- Shared decision making with central support

Antenatal Communication and Maternal / Neonatal Transport

- Antenatal collaborative perinatal discussion
- Survival focused or Palliative care-Local where possible
- Shared decision making with central support
- IUT package / Ex-utero transfer
- Perinatal-Optimisation – (Steroids/MgSO4/DCC)

Delivery Room, Early NNU, Golden Hours and Access

- Delivery room Pause/Perinatal Pause-Perinatal Passport
- DCC Support
- Senior intubator
- Breast milk expression support-initiate feeds/colostrum as mouthcare
- Admission Pause/checklist-Procedures carried out by skilled practitioners

Respiratory Management

- Avoid extubation in first 72 hours
- TTV mode of ventilation
- NIPPV when extubation possible
- Rolling programme of nursing education on mask/prong placement and nasal breakdown support.
- Steroids ?

Cardiovascular and Haemodynamics

- The most controversial
- UAC / UVC placement – Later Goal posting at 72 hours
- Avoid rapid fluid boluses
- Consider-Echo’s/NIRs/Ductal treatments

Fluids and Nutrition

- Need generous fluids 120-140 ml/kg/day from the off, but also need to loose 5-10% weight over first 5 days
- 6-8 hourly fluid balances-I like to suggest an aim
- Consider daily incubator weights
- Sodium free bag
- Avoid hyperchloraemia-No saline Boluses !!
- Reduce your sugar load-Insulin is almost pointless
- Start 2 hourly feeds and increment
- Consider glycerine chips
- Fortify feeds early
- Consultant lead blood tests-Stop doing formal Lab samples all the time !!!

Infection prevention and skin care

- Aseptic Non-touch technique for all procedures and line changes etc
- Minimise skin contacts/breaks/chemical trauma
- Use special silk sheets/fluidised positioner
- Regular assessments/standardised documentation/treatments
- Consider escalating fungal treatments if any significant skin breakdown

Neuro-Critical

- Head in supine, midline and head up position for 72 hours
- Minimal handling-6-8 hours ?
- Slow aspiration/flushing of UAC/UVC
- Avoid elevation of legs
- Minimise exposure to sensory stimuli
- Avoid hypocarbia-TTV

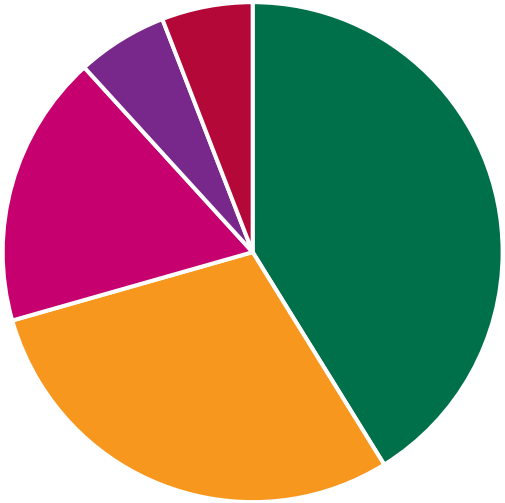
Family centred support (including palliative care) and neonatal team support

- Offer family centred psychological support
- Parallel care planning/Anticipatory care planning from beginning
- End of life support and Bereavement care
- Staff support-this is not going to be easy !

Local data 2018-2022 (5 years)

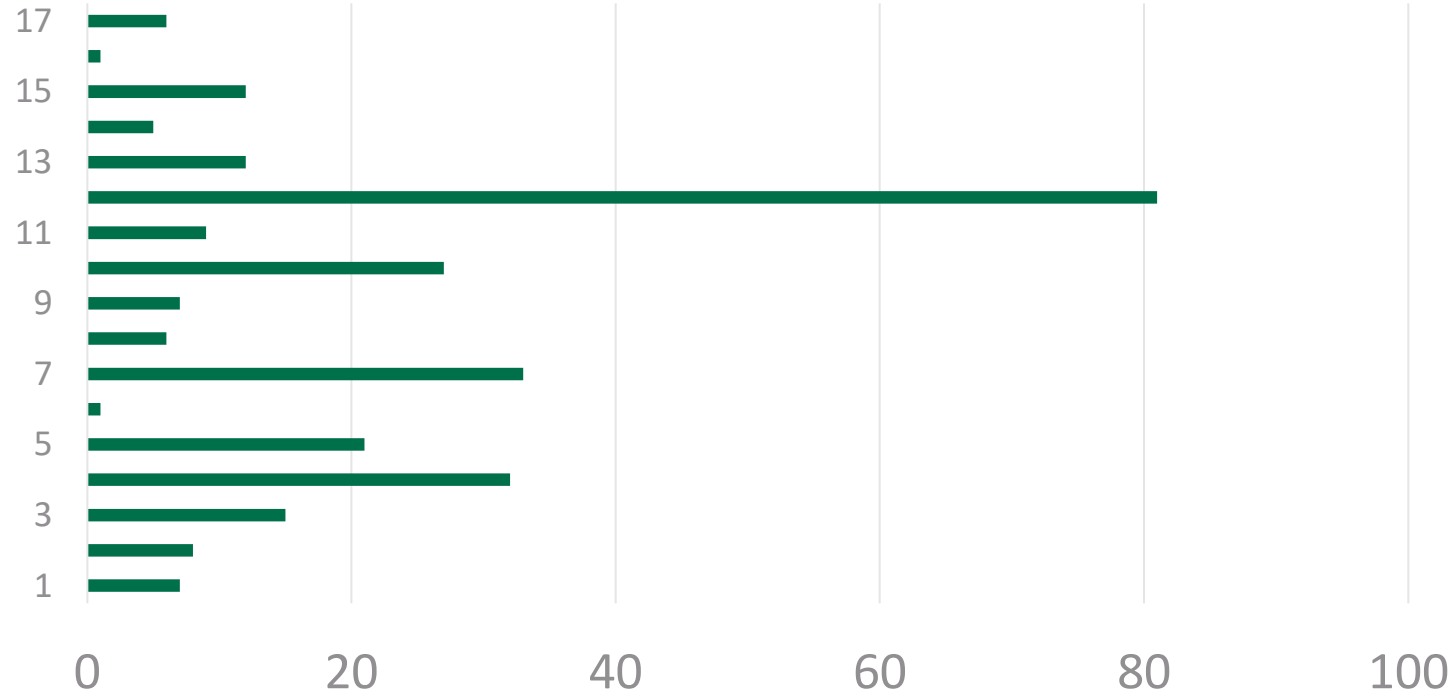
- We have not lost an infant in the delivery room over 5 years
- One Stillborn infant died during labour
- Overall survival 37% where active care was initiated
- Increased to 44% in 2022
- Worth going to [Home | Tiny Baby | Research (tinybabycollaborative.org)]

Main cause of death



- Sepsis
- NEC
- Severe Lung disease
- IVH/Circulatory failure
- Unexplained collapse

Timing for death-days



How SPSP Perinatal can support quality improvement in your unit

Jo Thomson

Senior Improvement Advisor,
Healthcare Improvement Scotland

Scottish Patient Safety Programme

SPSP aims to improve the safety and reliability of care and reduce harm

Core Themes

- Essentials of Safe Care
- SPSP Programme improvement focus
  SPSP Perinatal
- SPSP Learning System

Neonatal mortality and morbidity

2023 Perinatal Driver Diagram

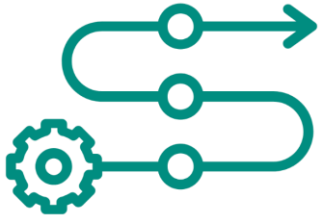
What we are trying to achieve…	We need to ensure…	Which requires…
Reduce Neonatal Mortality and Neonatal Morbidity by: - *Reducing complications of prematurity* - *Reducing late preterm and unexpected term admissions to NNU* *By [locally agreed aim]* *By 31st March 2025*	Person centred care* considers the Continuity of Carer approach	Women / birthing people and families are listened to and included in care decisions Person centred care planning Family centred approach with a focus on reducing separation Inclusive care pathways which provide equitable and culturally appropriate access and treatment
	Reduction in preterm birth	Screening to identify woman / birthing person at high-risk of preterm birth Clear pathways to ensure ease of access for women / birthing people and families to maternity services Safe clinical and care processes*
	Delivery of evidence based preterm care	Perinatal optimisation Reliable delivery of evidence based interventions Collaborative perinatal team working
	Reduction of avoidable term and late preterm admissions	Avoidance of elective births before 39 weeks unless medically indicated Risk assessment, appropriate monitoring and escalation in labour Delivery of evidence based care to optimise postnatal transition Recognition, response and escalation of deterioration
	Leadership to promote a culture of safety at all levels*	Psychological safety Staff wellbeing System for learning Safe staffing

*Essentials of Safe Care

https://ihub.scot/improvement-programmes/scottish-patient-safety-programme-spsp/spsp-perinatal/

Programme Aims

The **SPSP Perinatal Programme** will focus on the following aims:



- Reduction in stillbirth
- Understanding and addressing the variation in caesarean section rate
- Improving the recognition, response and review of the deteriorating woman / birthing person
- Reduction in neonatal mortality and morbidity

https://ihub.scot/improvement-programmes/scottish-patient-safety-programme-spsp/spsp-perinatal/

Supporting Improvement

Wide variety of SPSP and SPN resources to support improvement in delivery of care and outcomes for these women and babies:

- SPSP Perinatal Programme change package
  SPSP Perinatal programme | Healthcare Improvement Scotland - SPSP Perinatal (ihub.scot)

- Scottish Perinatal Network In Utero Transfer Pathway
  In-Utero-Transfers-in-Scotland-CLU-to-CLU.pdf (perinatalnetwork.scot)

- SPN National Guidance - Management of Extreme Preterm Infants (22+0 to 23+6 weeks)
  https://perinatalnetwork.scot/wp-content/uploads/2024/01/National-Neonatal-Network-Management-of-Extreme-Preterm-Infants-220-to-236-weeks-Guideline-v1.0.pdf

Supporting Improvement

- Enhanced collaborative perinatal team working and communication
  - Joint perinatal decision making
  - Joint approach to counselling
  - Adopting shared goals in the interests of mothers and babies

- Promoting a QI approach to all aspects of perinatal optimisation

- Learning from existing “Preterm Birth Clinics”

Staying in touch

SPSP Perinatal mailing list

SPSP Perinatal Twitter

Scottish Perinatal Network mailing list

Scottish Perinatal Network Twitter

Or send us an email at
his.spsppp@nhs.scot or
nss.perinatalnetwork@nhs.scot

Evaluation QR code
Please scan the evaluation QR code to give us feedback