Guidelines relating to the Birth of an Extremely Premature Infant (22+0 -26+6 weeks Gestation)

TARGET AUDIENCE	All staff involved in maternity and neonatal care.
PATIENT GROUP	Pregnant people and extremely premature neonates.

Clinical Guidelines Summary

Perinatal care at extremely preterm gestations will always need to be individualized and discussions around management should take a collaborative perinatal approach involving the maternity team, neonates and the family. We consider the option of active (survival based) care of babies born from 22 weeks, in line with guidance from BAPM (British Association of Perinatal Medicine).

It is essential that such decisions reflect all relevant prognostic information including:

- Fetal factors
- Clinical conditions (such as presence of premature pre-labour rupture of membranes (PPROM) or chorioamnionitis)
- Therapeutic strategies
- Clinical setting

The package of obstetric care which *may* be offered to parents may include:

- Antenatal steroids
- Tocolysis
- Antenatal transfer to a tertiary obstetric centre co-located with a neonatal intensive care unit (NICU)
- Magnesium sulphate for neuroprotection
- Deferred cord clamping, ideally for 60 seconds or more
- Intrapartum fetal heart rate monitoring
- Caesarean section (if potential benefits are considered to outweigh risks)

Immediate neonatal considerations at extremely premature birth include:

- Thermal management
- Umbilical cord management
- Expressed breast milk

Guideline Body

Care of the baby, woman and family around the time of an extremely preterm birth is one of the most challenging aspects of perinatal medicine, both for clinicians and families.

The management of couples likely to deliver an extremely premature infant can be fraught with problems. Crucial to any decision in relating to intervention is a review of the best available data for gestational age assessment. Where there is doubt about gestational age assessment, particularly in late bookers, it is safer to err on the side of viability. Recent published survival and morbidity data based on gestational age should be referred to when counselling such couples. Perinatal care at extremely preterm gestations will always need to be individualised and discussions around management should take a collaborative perinatal approach involving the maternity team, neonates and the family. It is essential that such decisions reflect all relevant prognostic information and not simply gestational age.

Communication

- Good communication between parents and health professionals is of paramount importance. Both a consultant obstetrician and neonatologist should agree a provisional management plan based on clinical information and outcome data for all women likely to deliver between 22+0 and 26+6 weeks.
- Parents should be given time to consider this information and allowed to express their own thoughts in relation to their management.
- Management plans should be clearly recorded in the case notes including parental response.

We consider active resuscitation of babies born from 22+0 weeks, in line with guidance from BAPM (British Association of Perinatal Medicine), "**Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation"** A Framework for Practice- October 2019" (1). Much of the below guideline is based on this recent guidance.

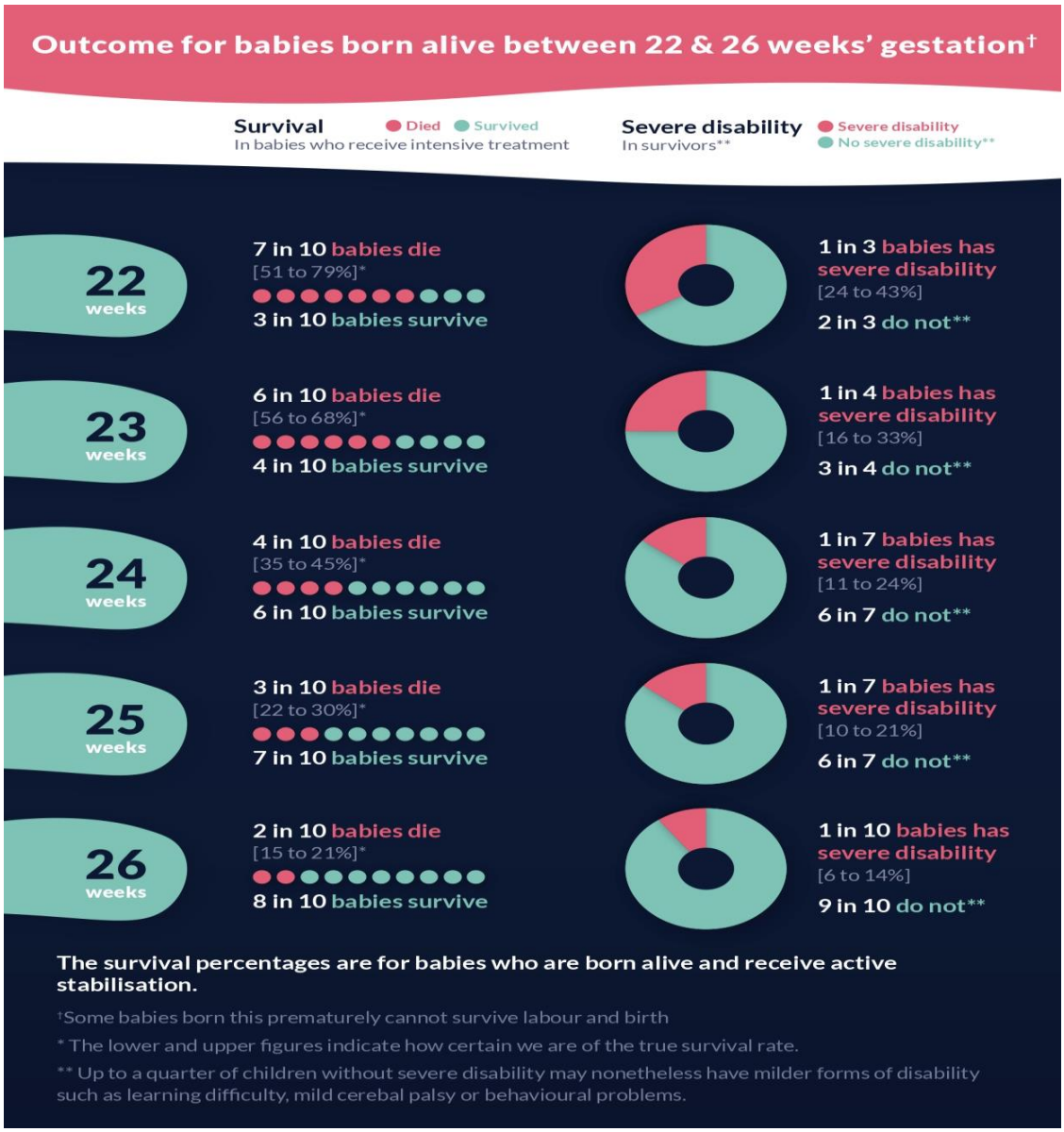

Figure 1. Infographic - from BAPM – "**Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation"** A Framework for Practice- October 2019

Risk-Based Approach to Decision-Making

A key ethical consideration for decisions about instituting life-sustaining treatment for an extremely preterm baby is the baby's prognosis – the risk of an acceptable (or unacceptable) outcome if active (survival focused) management is undertaken.

Assessment of the risk for the baby

1. Gestation-based risk assessment, including mortality and survival with severe impairment

Neonatal stabilization may be considered for babies born from 22+0 weeks of gestation following assessment of risk and multi professional discussion with parents.

Risk assessment should be performed with the aim of stratifying the risk of a poor outcome into three groups:
Extremely high risk – Comfort focused (palliative) care would be the usual management.
High risk - Provide either survival focused (active) management or palliative care. This should be based primarily on the wishes of the parent.
Moderate risk - Active management should be planned.

The severe impairment category includes any of:

- Severe cognitive impairment with an intelligence quotient (IQ) lower than 55 (< -3 standard deviation); this will usually result in the need for special educational support and require supervision in daily activities
- Severe cerebral palsy – classified as Gross Motor Function Classification System (GMFCS) grade 3 or greater (see Appendix 1 in BAPM guidance)
- Blindness or profound hearing impairment

2. Modified risk assessment

Accurate information about the current pregnancy, including assessment of both fetal and maternal health should be used to refine gestation-based risk of absolute survival and survival without severe impairment.

A range of factors are associated with increased or decreased risk:

- **Fetal factors -** which may increase risk, include male sex, multiple pregnancy, congenital anomaly and poor fetal growth.
- **Clinical conditions -** which pose additional risk and have been associated with increased mortality and morbidity include PPROM before 24 weeks of gestation and clinical evidence of chorioamnionitis
- **Therapeutic strategies -** administration of antenatal steroid and magnesium sulphate are associated with improved survival and neonatal outcomes as well as reduced risk of childhood impairment, even before 24 weeks of gestation
- **Clinical Setting -** survival is highest at these extreme preterm gestations in centres with experienced staff and higher patient numbers.

A proposed visual tool for refinement of risk is illustrated as follows:

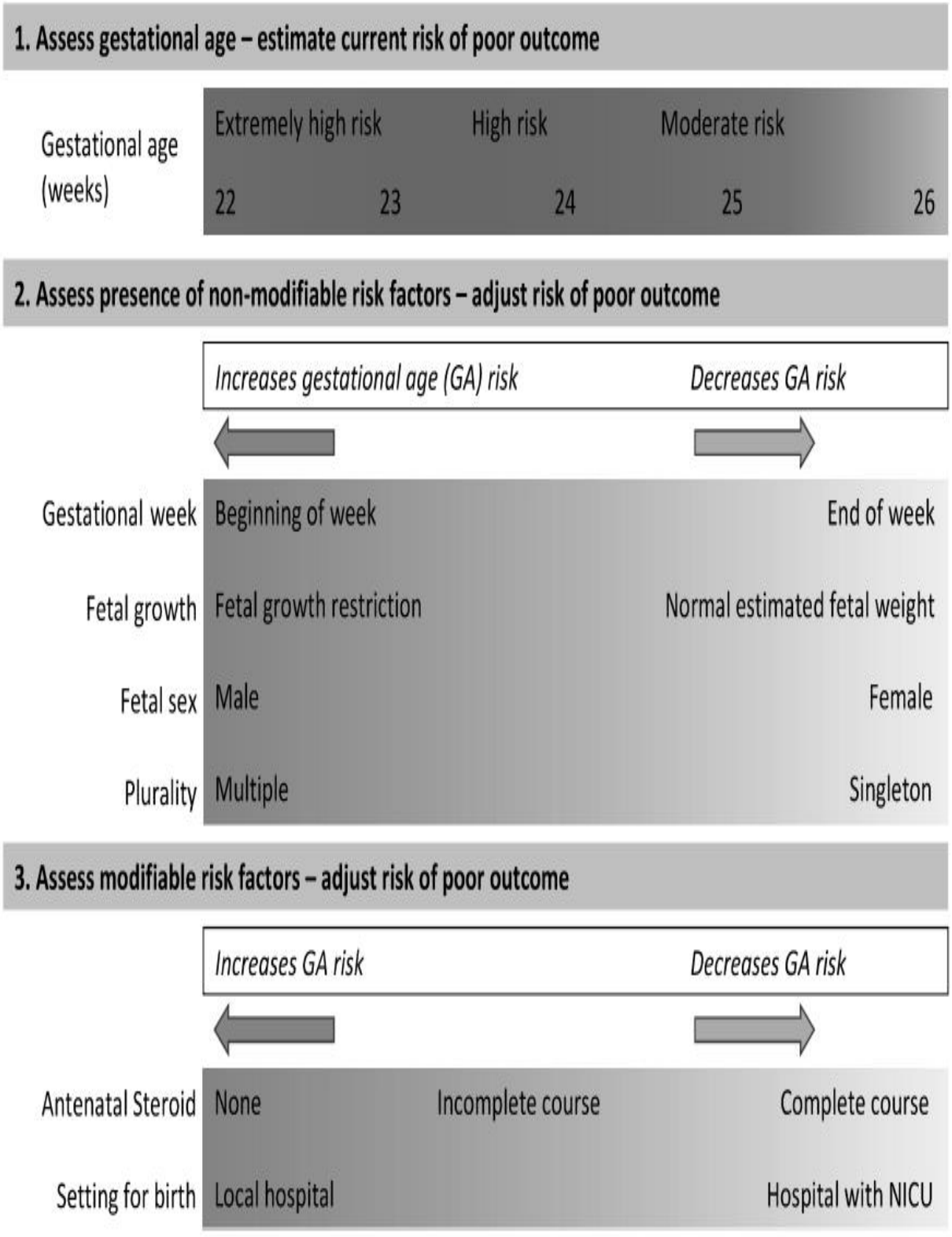

Figure 2. Image from BAPM – "**Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation"** A Framework for Practice- October 2019

The following represents the consensus of the Working Group in regard to risk categories for the purposes of this framework.

There is no objective way of defining a risk as 'extremely high' *versus* 'high' and families differ in the outcome that they regard as unacceptably poor. Thus risk assessment may need to be modified in the light of the parents' knowledge, views and values.

Extremely high risk

The Working Group considered that babies with a > 90% chance of either dying or surviving with severe impairment if active care is instigated would fit into this category. For example, this would include:
babies at 22+0 - 22+6 weeks of gestation with unfavourable risk factors
Some babies at 23+0 - 23+6 weeks of gestation with unfavourable risk factors, including severe fetal growth restriction
(rarely) babies ≥ 24+0 weeks of gestation with significant unfavourable risk factors, including severe fetal growth restriction

High risk

The Working Group considered that babies with a 50-90% chance of either dying or surviving with severe impairment if active care is instituted would fit into this category. For example, this would include:
babies at 22+0 - 23+6 weeks of gestation with favourable risk factors
Some babies ≥ 24+0 weeks of gestation with unfavourable risk factors and/or co-morbidities

Moderate risk

The Working Group considered that babies with a < 50% chance of either dying or surviving with severe impairment if active care is instituted would fit into this category. For example, this would include:
most babies ≥ 24+0 weeks of gestation
Some babies at 23+0 – 23+6 weeks of gestation with favourable risk factors.

Previous NHS Lanarkshire guidance advised that obstetric and neonatal interventions were generally not recommended for babies with an estimated fetal weight of < 500g. It is now not recommended to base these decisions on fetal weight alone and an overall assessment of prognostic factors should be made and increasingly active care is being offered to babies <500g (2). However, growth restriction at extremely preterm gestations should be considered as a significant prognostic factor of a poor outcome for the baby.

Decision-making around management of delivery, following risk assessment and after consultation with parents.

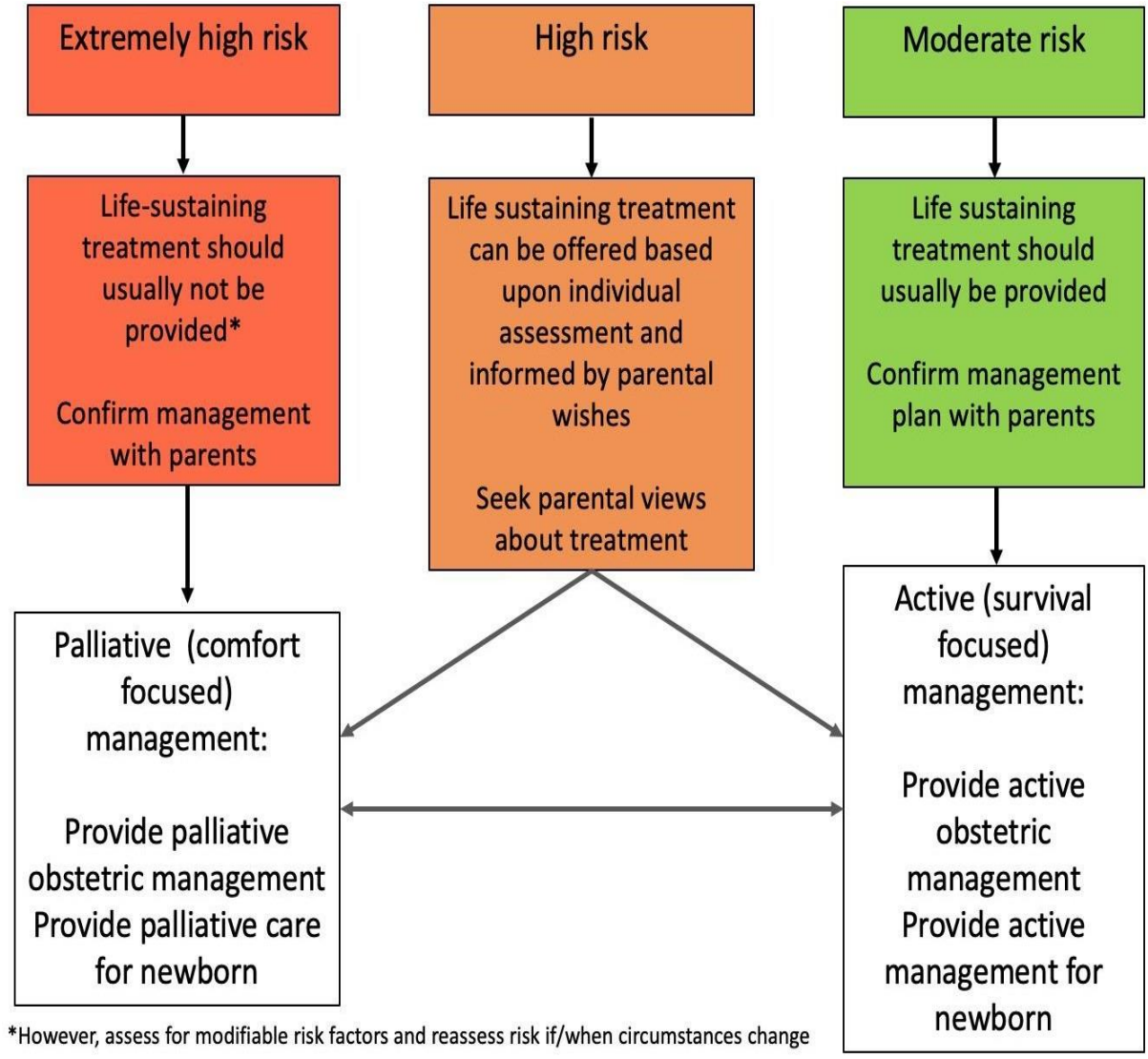

Figure 3. Diagram from BAPM – "**Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation"** A Framework for Practice- October 2019.

Obstetric management

Active (survival focused) obstetric management

The package of obstetric care to be offered to parents *may* (but not necessarily) include any or all of the following:

1. Antenatal steroids
2. Tocolysis
3. Antenatal transfer to a tertiary obstetric centre co-located with a NICU
4. Magnesium sulphate for neuroprotection
5. Deferred cord clamping, ideally for 60 seconds or more
6. Intrapartum fetal heart rate monitoring
7. Caesarean section (if potential benefits are considered to outweigh risks)

Antenatal steroids, tocolytic use, magnesium sulphate and deferred cord clamping have been shown to be of benefit in improving outcome in preterm infants. However, parents should be made aware that there is a paucity of data in relation to the magnitude of benefit and risks of these interventions, particularly below 24 weeks of gestation.

In utero **transfer** to a tertiary centre optimises outcomes for the baby, is better than *ex utero* transfer and is now recommended in the Scottish Maternity and Neonatal Services Review. The decision to for transfer should be led by the on-call obstetric and neonatal consultants, acknowledging that in some circumstances that a transfer may not be suitable e.g. in progressive preterm labour or if signs of fetal compromise indicating urgent birth.

From 26+0 weeks of gestation, when active management is planned, women in established preterm labour should be recommended continuous electronic fetal monitoring (CEFM).

Below 26 weeks of gestation, a senior obstetrician should be involved in decisions around intra-partum fetal heart rate monitoring as there is a lack of evidence to inform practice. The family should be made aware of the rationale for either recommending or withholding fetal heart rate monitoring; for example, it may be appropriate not to monitor the fetal heart if delivery by caesarean section is not part of the agreed package of care, either because it is considered that the risks of caesarean section outweigh any potential benefits or because parents have declined caesarean section should there be a fetal heart rate abnormality. Autonomic immaturity at gestations below 26 weeks makes interpretation of CEFM difficult and there is no evidence that CEFM improves outcomes compared to intermittent auscultation. Unfortunately, a higher proportion of babies at very premature gestations do not survive labour compared to later gestations and this should be sensitively discussed with the parents at the time of these discussions (see Figure 4).

In the majority of extremely preterm births, the mother presents in spontaneous labour and an uncomplicated vaginal delivery may be anticipated. The risk of head entrapment following breech presentation is approximately 10% but the evidence for delivery by caesarean section for extremely preterm babies is limited and of poor quality and prognosis is more likely to be dictated by factors other than mode of delivery. NICE

guidance is that delivery by caesarean section may be considered in cases of breech presentation after 26 weeks of gestation. For all these reasons it is essential that obstetric care is individualised after full discussion between the family and a senior obstetrician along with the neonatal team.

Preterm Perinatal Package

A coordinated perinatal team effort should be taken to support the Scottish Patient Safety Programme Perinatal Package (3). There should be regular maternity and neonatal liaison to achieve this, with particular focus on decisions around antenatal steroids, magnesium sulphate and deferred cord clamping.

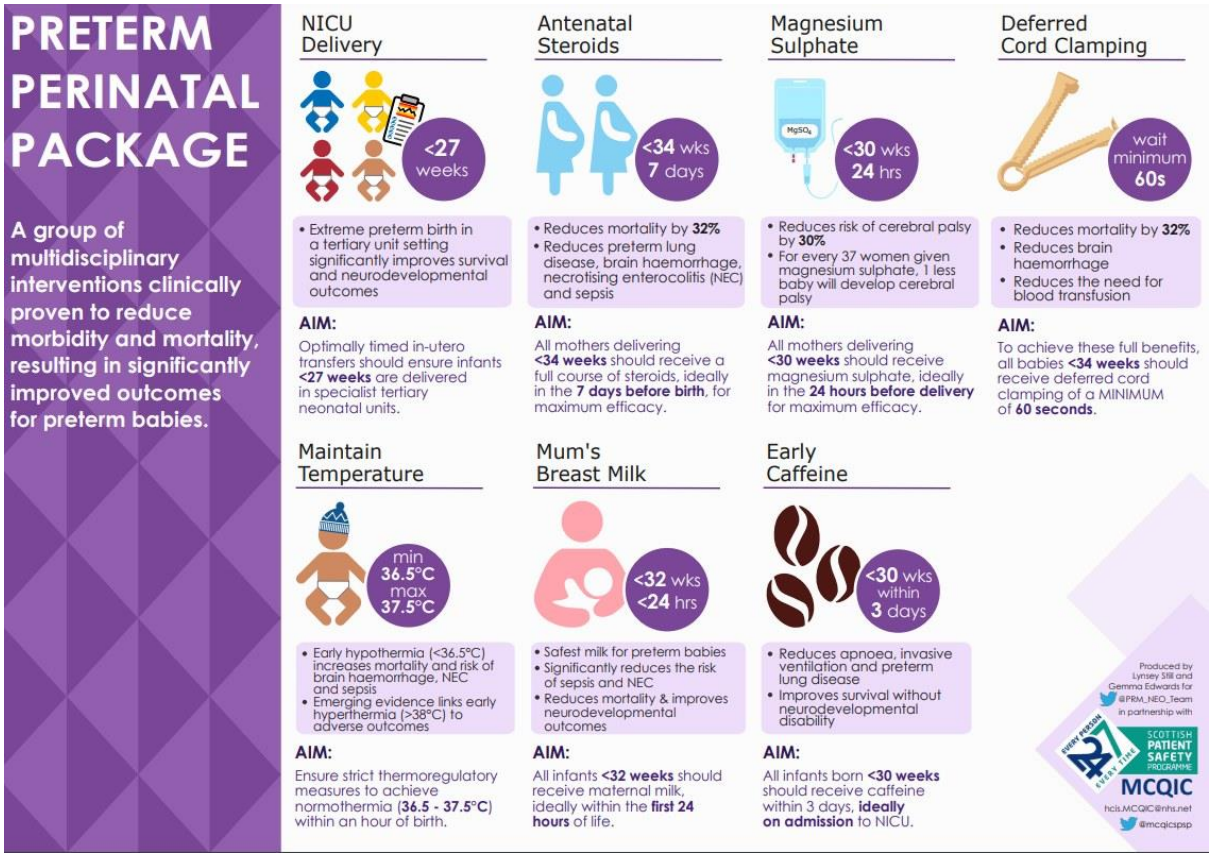

Figure 4. Scottish Patient Safety Programme (SPSP) Perinatal Programme. Preterm Perinatal Wellbeing Package Poster. Available at [20191023-ppwp-poster-v10.pdf (ihub.scot)]

In addition to the items on the preterm perinatal package, there should be an effort by the perinatal team to speak to and counsel mothers and families with an expectant extremely premature baby before the baby is born.

The content of this discussion will vary depending on the clinical circumstances and the psychological capacity of the family at that time period. However, some factors to consider with antenatal counselling include:

- Using a private, quiet place

- Use of translation services for families who require this
- Exploring the family's understanding and expectations of the situation
- Acknowledging prognostic uncertainty
- Conveying the expected category of risk to the baby
- Mentioning the teams that will be present at the baby's birth, the possible need for resuscitation, and the baby's admission to the neonatal unit, after a delivery room cuddle wherever possible
- Offering information on the clinical course, tailored for that individual's circumstances (e.g. preterm lung disease and its management, infection, cranial surveillance for intraventricular haemorrhage, feeding and gastrointestinal challenges) and check their understanding of this
- Discussing breast milk expression, the importance of initiating this as soon as possible after birth and make aware of existing bundles to support this (Golden Drops)
- Offering a tour of the neonatal unit
- Being aware of the emotional challenges and offering psychology support where applicable

Immediate Neonatal Considerations At Extremely Premature Births

Thermal Control

- Protect the baby from draughts. Ensure windows are closed and air-conditioning appropriately programmed.
- Keep the environment in which the baby is looked after (e.g. delivery room or theatre) warm at 23–25 °C.
- For babies ≤ 28 weeks gestation the delivery room or theatre temperature should be > 25 °C.
- For babies <32 weeks gestation place into a plastic bag (apart from face, and use the bag drawstring to loosely close the bag around the neck).
- Use radiant heat if available during deferred cord clamping
- Further interventions which may be required include increased room temperature, warm blankets, head cap and thermal mattress.

Umbilical Cord Management

- A perinatal team effort for a minimum of 60 seconds of deferred cord clamping should be made for every baby; the obstetric and neonatal teams should work together to support this process.
- The World Health Organisation, National Institute for Clinical Excellence, Cochrane Library, Royal College of Obstetricians and the British Association of Perinatal Medicine support this as gold standard practice.
- There are very few contraindications to deferred cord clamping, led by the obstetric team (e.g. massive maternal haemorrhage).
- In extremely premature infants who are compromised at birth, clamping the cord may hamper their ability to transition, and so deferred cord clamping should be facilitated in these situations too.

- Resuscitation measures for compromised babies that can be instituted when the cord is still intact include:
- Opening the airway and maintaining the airway in a neutral position
- Stimulating the baby
- Ensuring good thermal regulation as detailed above
- Mask CPAP or ventilation if available
- If there is complete separation of the placenta when the baby delivers, the placenta can be held above the baby before clamping the cord.

Expressed Breast Milk

- Mothers of extremely premature babies should be supported to initiate colostrum expression shortly after birth (ideally within the first hour of life) wherever possible.
- Thereafter, the mother should be supported to express as frequently as possible, with no longer than a 6 hour gap.
- Collection of breast milk should follow standard local protocol and the neonatal unit should be informed when colostrum is available.

Comfort focused (palliative) obstetric management

When a decision is made for palliative comfort focused (palliative) management of the baby at birth, only interventions for maternal benefit are appropriate. Intrapartum fetal heart rate monitoring is not advised, although assessing or listening for the presence of a fetal heart to check viability may be helpful in clarifying expectations around the baby's condition at birth and be preferable for parents.

<22 weeks

Obstetric and neonatal interventions are **not recommended**. Parents should be informed that tocolysis, steroid therapy fetal monitoring and in utero transfer are not indicated. Neonatologists should **not** routinely be called to provide antenatal counselling or be called to the delivery. Parents should be warned that their baby may shows signs of life at delivery such as terminal gasping which can be distressing. These babies are not candidates for in utero transfer.

Gestational Week	22 weeks	23 weeks	24 weeks	25 weeks	26 weeks
All births	486	510	656	664	832
Births alive at onset of labour	290	362	497	508	674
Live births	183	301	456	486	662
% live births (of those alive at onset of labour)	**63%** **57 to 69**	**83%** **79 to 87**	**92%** **90 to 94**	**96%** **94 to 98**	**98%** **97 to 99**
Delivery room deaths	155	78	26	19	16
% deaths before admission	**85%** **80 to 90**	**26%** **21 to 31**	**6%** **4 to 8**	**4%** **2 to 6**	**2%** **1 to 3**
Live births receiving active care	43	264	449	486	662
% receiving active care (of all live births)	**23%**	**88%**	**98%**	**100%**	**100%**
Admitted for neonatal care	28	223	430	467	646
% admitted for neonatal care (of births receiving active care)	**65%** **51 to 79**	**85%** **81 to 89**	**96%** **94 to 98**	**96%** **94 to 98**	**98%** **97 to 99**
Deaths < 1 year	13	122	160	108	106
Survivors to 1 year	15	101	270	359	540
Survival					
Of those alive in labour	**5%** **2 to 8**	**28%** **23 to 33**	**54%** **50 to 58**	**71%** **67 to 75**	**80%** **77 to 83**
Of live births receiving active care	**35%** **21 to 49**	**38%** **32 to 44**	**60%** **55 to 65**	**74%** **70 to 78**	**82%** **79 to 85**
Of those admitted to intensive care	**54%** **36 to 72**	**45%** **38 to 52**	**63%** **58 to 68**	**77%** **73 to 81**	**84%** **81 to 87**

Figure 4. Number and percentage of births, including births where the fetus was alive at onset of labour, live births, births receiving active care, admissions for neonatal care and survival to 1 year of age for births in 2016 in the UK. Recording of active care on the MBRRACE-UK database commenced during 2016 and thus rates are inferred from recording of a total of only 292 deaths (4).

References/Evidence

1. British Association of Perinatal Medicine (2019). Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation. A BAPM Framework for Practice.

2. Smith, LK, et al. (2023). Effect of national guidance on survival for babies born at 22 weeks' gestation in England and Wales: population based cohort study. BMJMedicine. Available at Effect of national guidance on survival for babies born at 22 weeks' gestation in England and Wales: population based cohort study | BMJ Medicine

3. Scottish Patient Safety Programme (SPSP) Perinatal Programme. Preterm Perinatal Wellbeing Package Poster. Available at 20191023-ppwp-poster-v10.pdf (ihub.scot).

4. MBRRACE-UK (2016). Supplementary report on survival up to one year of age for babies born before 27 weeks gestational age.

Appendices

1. Governance information for Guidance document

Lead Author(s):	Alison Duncan
Endorsing Body:	NHS Lanarkshire
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Responsible Person (if different from lead author)	Alison Duncan

CONSULTATION AND DISTRIBUTION RECORD	
Contributing Author / Authors	Amarpal Bilkhu
Consultation Process / Stakeholders:	Maternity and neonatal staff Maternity CEG
Distribution	All in maternity and neonates

CHANGE RECORD			
Date	**Lead Author**	**Change**	**Version No.**
June 2022	Dina McLellan	Guideline developed after BAPM guidance introduced.	1
	Alison Duncan	Review, revise and update of policy in line with contemporary professional structures and practice. Liaison and direct input from the neonatalogy team. Sections on the Preterm Perinatal Package and Immediate Neonatal Considerations written by Amarpal Bilku.	2
			3
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