

## Kent Surrey and Sussex Neonatal Operational Delivery Network

### Infants at the threshold of viability: facilitating decision making for transfer and intervention

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Distribution	Neonatal Units in KSS
Implications of race, equality & other diversity duties for this document	This guideline must be implemented fairly and without prejudice whether on the grounds of race, gender, sexual orientation or religion.

## Aim of Guideline

Increasingly smaller and more immature infants are able to survive with good outcomes. These outcomes are correlated with provision of excellent perinatal care, in a centre with a tertiary neonatal intensive care unit.

The aim of this guideline is to facilitate a common approach to the risk assessment of women presenting at the threshold of viability.

Threatened preterm labour  
Evidence of fetal or maternal compromise

Take steps to prevent preterm delivery as appropriate  
Early counselling for family by obstetric and neonatal team as appropriate

<22+0 weeks

22+0 to 23+6

>24+0

Expectant management, interventions for maternal benefit only offered

Steroids not administered

No need for active listening in labour

Parents counselled  
infant may show signs of life

Comfort care offered to newborn

Survival focussed management can be offered after discussion with the parents and depending on individual circumstances

Survival focussed treatment should usually be offered following review of risk factors

Survival focussed management to include consideration of

In utero transfer

Tocolysis

Provision of antenatal steroids and intrapartum magnesium sulphate

Active monitoring in labour

Assisted delivery including caesarean section (if potential benefits outweigh risk)

Neonatal team attendance at delivery

Optimal cord clamping of minimum 60 seconds

Assessment on delivery and resuscitation if deemed appropriate after assessment

## **Assessment of Risk**

The publication of the BAPM framework in 2019 acknowledges that gestation alone is not the only determinant of outcome; with a changing focus to assess individual risks for that mother and child. This focus may be survival focused (active intervention), or comfort focused (provision of palliative care); depending on individual circumstance and following detailed assessment of the following factors.

1. In-utero environment
  - a. Sepsis, including chorioamnionitis
  - b. Prolonged rupture of membranes
  - c. Maternal health (including obesity) and placental health
  - d. Congenital disease or malformations
  - e. Antenatal preparation for preterm labour and delivery such as administration of antenatal steroids, magnesium sulphate, antibiotics
  
2. Ex-utero environment
  - a. Proposed place of delivery
  - b. Wishes of the family

The BAPM framework of 2019 considers the following criteria:

**Extremely high risk:** For babies with an extremely high chance of death, or surviving with an unacceptably severe impairment despite treatment, palliative care would normally be in the best interests of the baby and life-sustaining treatment would not usually be offered.

**High risk:** For these babies with a moderate to high chance of death, or surviving with unacceptably severe impairment despite treatment, it is uncertain whether active care is in the best interests of the baby and their family. Parents should be counselled carefully and parental wishes should inform a joint decision to provide either active or palliative treatment. Ideally, a senior neonatal clinician who has previously met the family will be available to attend the birth and supervise implementation of the agreed plan.

**Moderate or low risk:** These babies are most likely to survive with a good outcome. A senior neonatal clinician should attend the birth; and active intervention should be offered.

1. Assess gestational age – estimate current risk of poor outcome

	Extremely high risk	Moderate-high risk		Lower risk	
Gestational Age	<22	22	23	24	25 26

2. Assess presence of non-modifiable risk factors – adjust risk of poor outcome

	Higher risk	Lower risk
Gestational week	Beginning of week	End of week
Estimated birth weight	Small for GA	Normal for GA
Fetal sex	Male	Female
Singleton/Multiple	Multiple	Singleton

3. Assess modifiable risk factors – adjust risk of poor outcome

	Higher risk	Lower risk
Antenatal steroids	No	Incomplete Yes
Place of birth	Outborn (non tertiary NICU)	Inborn (tertiary NICU)

Risk assessment graphic as provided by BAPM, 2019. In addition to these; local data suggests that the presence of sepsis, chorioamnionitis and prolonged rupture of membranes are equally important factors to consider in your risk assessment. Additionally any antenatal diagnosis of congenital anomaly must be taken into account.

## **Antenatal Management**

### **Recommendations:**

- All pregnancies presenting with threatened preterm labour >21+6 should be considered for the possibility of survival focussed management
- Use a validated risk assessment tool to assess likelihood of premature labour and delivery (e.g. QUiPP app)
- All threatened preterm deliveries at <27 weeks should have a documented management plan by a senior obstetrician, in consultation with the neonatal team, to include:
  - ❖ Appropriate antenatal counselling (ideally done jointly with obstetric and neonatal team)
  - ❖ Review of modifiable risk factors (see appendix 1)
  - ❖ Decision regarding comfort focussed or survival focussed care
  - ❖ Assessment of need for transfer
  - ❖ Clear plan for monitoring and reassessment points
  - ❖ Plan on appropriate interventions and timing of these; including mode of delivery
- Each unit, and ideally LMNS, should have a policy on in utero transfer

### **Management of Modifiable Risk factors**

Following review of the case; if a decision has been made to provide active intervention any modifiable risk factors should be optimised; regardless of gestation. With these in mind, appendix 1 is a resource to aid assessment of modifiable risk factors.

If a decision has been made to transfer in utero, the network tertiary unit should make every possible effort to accept and facilitate transfer.

<b>Non-modifiable risk factors</b>	<b>Modifiable risk factors</b>
Gestation	Steroids
Estimated weight	Magnesium sulphate
Sex	Delivery at a tertiary unit
Multiplicity	Management of chorioamnionitis

### **A note on obstetric management of extremely preterm infants**

At these very early gestations (<26 weeks) there is no evidence CTG or caesarean improves outcomes and it may result in maternal morbidity and impact adversely on future

pregnancies. At 25 weeks or less, CTG monitoring or delivery by caesarean in the fetal interest is rarely appropriate. This should be an individualised decision made after discussion with the family and senior members of the obstetric and neonatal team.

Management should include senior obstetric presence (in or out of room) actively managing the length of second stage, intermittent auscultation, or scan and intervention if there is evidence of prolonged fetal deceleration. This may help the neonatal team prepare for expected condition at birth and allow for manoeuvres to assist delivery including gentle assisted breech or forceps.

### **Decision for comfort focussed care**

Above 24 weeks; in the absence of major congenital anomalies or poor prognostic indicators (such as severe growth restriction) the majority of infants are expected to survive and therefore almost all will have survival focussed care including an attempt at resuscitation and/or stabilisation. In situations where the parents are not in agreement with this approach please discuss with the tertiary centre for advice.

Where the overall prognosis is felt to be poor; following review of individual risk factors and discussion with the family, a decision may be reached regarding comfort focussed care. It is important that the family and staff are supported in the practicalities of the situation – including that the infant may show signs of life which may persist for some time (minutes to hours). It is ideal for these families to be looked after in a bereavement suite with a dedicated midwife, where such facilities exist. Please refer to the KSS network bereavement guideline.

These families should be offered bereavement follow up in addition to obstetric review. They should be made aware of the process of PMRT.

## **Expected actions at stabilisation of an extremely preterm infant (<25 weeks)**

### **Recommendations**

- Delivery should be attended by the neonatal team, ideally with consultant presence
- If there is time, have a team briefing prior to delivery to assign roles and expected actions/outcomes
- The focus is on supporting stabilisation rather than resuscitation.
- Wherever possible optimised cord clamping (delay of up to three minutes) should be undertaken
- Commence resuscitation in 30% oxygen as per resuscitation council guidelines
- All infants <25 weeks will require respiratory support. Intubation when required should be attempted by the most senior clinician available.
- Active thermoregulation must be undertaken to keep temperature within the normal range 36.5-37.5
- Do not undertake procedures unless the infant is warm; a peripheral line may be sufficient for transfer and hydration until further assessment at the tertiary centre.
- Consider surfactant early, if oxygen requirement is persisting  $\geq 30\%$  following stabilisation.
- Contact your local tertiary unit for advice at any stage.

### **Decision making regarding attempted stabilisation**

- At all times keep in mind the risk assessment made prior to delivery; and use this to help guide decision making
- In an extremely preterm infant born without signs of life, inaudible heart beat; it is reasonable to not offer further resuscitation efforts
- If a heart beat is present, it is reasonable to offer oxygen and inflation breaths and assess for response to this.
- If there is a response to initial airway management it may be appropriate to consider further interventions such as intubation. If there is no response despite good technique, it is reasonable to discontinue resuscitation efforts.
- In the situation where there has been some response but this is not sustained, it may be appropriate to consider offering 30 seconds of chest compressions (whilst being mindful of the antenatal risk assessment). The use of drugs/boluses for resuscitation is rarely associated with a good outcome at these gestations; and their use should only be considered in consultation with a senior member of the team; in response to specific clinical situations such as hypovolaemia.
- Prolonged attempts at resuscitation should be avoided and are not in the best interests of the infant.

## Scope of Guideline Framework

The guideline applies to all Neonatal Units covered by Kent Surrey and Sussex Neonatal ODN.

This includes the following hospitals:

Kent, Surrey and Sussex	
Medway Hospital NHSFT	-Medway Maritime Hospital, Gillingham
East Kent Hospitals University NHSFT	- William Harvey Hospital, Ashford -Queen Elizabeth the Queen Mother, Margate
Ashford and St Peter's NHSFT	-St Peter's Hospital, Chertsey
University Hospitals Sussex	-Royal Sussex County Hospital, Brighton -Princess Royal Hospital, Haywards Heath -Worthing Hospital, Worthing
Frimley Health NHSFT	-Frimley Park Hospital
Surrey and Sussex Healthcare NHST	- East Surrey Hospital, Redhill
Maidstone and Tunbridge Wells NHST	- Tunbridge Wells Hospital, Pembury
Dartford and Gravesham NHST	- Darent Valley Hospital, Dartford
East Sussex Healthcare NHST	- Conquest Hospital, Hastings
Royal Surrey NHSFT	- Royal Surrey County Hospital, Guildford

## Key Points:

## References

BAPM Framework for Management of Extreme Prematurity 2019

Mercurio, M.R., Carter, B.S. Resuscitation policies for extremely preterm newborns: finally moving beyond gestational age. *J Perinatol* **40**, 1731–1733 (2020). <https://doi.org/10.1038/s41372-020-00843-4>

Appendix 1. **Assessment of modifiable risk factors to aid decision making**

1. Circle a value for each criteria
2. Review modifiable factors and whether altering these changes the overall clinical picture.
3. Remember that this is a visual aid to decision making but overall clinical assessment is most important.

Gestation	Weight	Dopplers	Multiplicity	Steroids	Magnesium Sulphate	Place of Birth	Chorioamnionitis	PPROM	
22	<9 <sup>th</sup> centile	Reversed	>2	None	None	SCU	Confirmed	>24 hours	Extremely high risk High risk of death/poor outcome
23-24	9-25 <sup>th</sup> centile	Absent	Twins	Incomplete	Incomplete	LNU	Suspected	0-24 hours	Moderately high risk
25+	>25 <sup>th</sup> centile	Normal	Singleton	Complete	Complete	NICU	None	None	Lower risk High chance of survival/good outcome

<p><b>S</b> Situation</p>	<p><b>What is happening now?</b>          Patient name          Gestation          Reason for handover</p>																																																	
<p><b>B</b> Background</p>	<p><b>What has happened in the past that is relevant?</b>          Significant pregnancy events           Discussion with family</p>																																																	
<p><b>A</b> Assessment</p>	<p><b>What is the Problem/Issue?</b></p> <table border="1" data-bbox="302 699 2190 1393"> <thead> <tr> <th>Gestation</th> <th>Weight</th> <th>Dopplers</th> <th>Multiplicity</th> <th>Steroids</th> <th>Magnesium Sulphate</th> <th>Place of Birth</th> <th>Chorioamnionitis</th> <th>PPROM</th> <th></th> </tr> </thead> <tbody> <tr> <td>22</td> <td>&lt;9<sup>th</sup> centile</td> <td>Reversed</td> <td>&gt;2</td> <td>None</td> <td>None</td> <td>SCU</td> <td>Confirmed</td> <td>&gt;24 hours</td> <td>Extremely high risk High risk of death/poor outcome</td> </tr> <tr> <td>23-24</td> <td>9-25<sup>th</sup> centile</td> <td>Absent</td> <td>Twins</td> <td>Incomplete</td> <td>Incomplete</td> <td>LNU</td> <td>Suspected</td> <td>0-24 hours</td> <td>Moderately high risk</td> </tr> <tr> <td>25+</td> <td>&gt;25<sup>th</sup> centile</td> <td>Normal</td> <td>Singleton</td> <td>Complete</td> <td>Complete</td> <td>NICU</td> <td>None</td> <td>None</td> <td>Lower risk High chance of survival/good outcome</td> </tr> </tbody> </table>										Gestation	Weight	Dopplers	Multiplicity	Steroids	Magnesium Sulphate	Place of Birth	Chorioamnionitis	PPROM		22	<9 <sup>th</sup> centile	Reversed	>2	None	None	SCU	Confirmed	>24 hours	Extremely high risk High risk of death/poor outcome	23-24	9-25 <sup>th</sup> centile	Absent	Twins	Incomplete	Incomplete	LNU	Suspected	0-24 hours	Moderately high risk	25+	>25 <sup>th</sup> centile	Normal	Singleton	Complete	Complete	NICU	None	None	Lower risk High chance of survival/good outcome
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Assessment of modifiable risk factors and plan to correct

Place of Birth/Transfer

Steroids

MgSO<sub>4</sub>

Sepsis

**R**

**Recommendations**

**What do you think needs to happen now?**

**Document:**

- How often will you monitor the fetus and how
- What time are reassessments planned
- What are the points for intervention
- Mode of delivery recommendations

Appendix 2. BAPM infographic on survival

