

Pre-hospital management of the baby born at extreme preterm gestation

A Framework for Practice

February 2022

In collaboration with





Contents

About this document	3
Working Group Members	4
Joint Chairs	4
Working Group Members	4
Introduction	5
Scope	5
Purpose	5
Development of the guidance	5
Context	5
Principles of care	7
Correct assessment	7
Correct management	7
Survival-focussed care	9
1. Thermal care	9
Stabilisation and resuscitation applicable to extreme preterm birth out of hos per Newborn Life Support (NLS) principles [9,10]	•
3. Transit to definitive care	12
Baby does not appear to respond to resuscitation	12
Comfort-focussed (palliative) neonatal care	13
Correct destination	15
Communication	15
Birth and death certification and registration	16
Staff support	16
References	17
Appendix A - Visual summary	18
Appendix B – Sands leaflet	19

About this document

The unplanned birth of an extremely preterm baby in an out of hospital setting is a challenging situation, even for experienced paramedics and ambulance clinicians.

Acknowledging the limitation of skills and equipment available, this consensus document offers a pragmatic approach to the management of unexpected extreme preterm birth in an out of hospital setting. Wherever practical, the Framework is aligned with other UK guidance around extreme preterm birth and resuscitation of the newborn [1-4]. Outcomes for extremely preterm babies born out of hospital will be poorer than for those babies of equivalent gestation born in the appropriate hospital setting and only a minority of babies born out of hospital before 24 completed weeks' gestation will survive [1]. Where gestation is certain, attempted resuscitation of the baby before 22 completed weeks' gestation is not appropriate and should not be undertaken. This advice represents a change from existing Joint Royal Colleges Ambulance Liaison Committee (JRCALC) clinical guidelines 2019 which recommend active resuscitation of the baby from 20 weeks' gestation [4]. When the mother is clinically unstable and limited personnel available, acute care of the mother should take precedence over acute care of an extremely preterm baby.

The importance of consistent, empathetic and professional care in helping parents come to terms with the trauma of extreme preterm birth cannot be underestimated. Professionals attending extreme preterm birth out of hospital should be offered an opportunity to debrief. It is also important that receiving hospital staff are aware of, and sympathetic to, difficult decisions that have been made out of hospital in challenging circumstances.

This document is intended to be fully inclusive; the words baby, pregnant person, mother, partner, father, parents and family are utilised, recognising the diverse range of people that may be impacted.

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Introduction

Scope

This document is intended to provide guidance to health care professionals attending an unplanned extreme preterm birth in an out of hospital setting.

While this Framework for Practice is aimed mainly at paramedics or ambulance clinicians, other attending professionals may include midwives, nurses, general practitioners, doctors with additional training in pre-hospital emergency medicine and/or other emergency care providers.

Purpose

To provide a practical framework for managing extreme preterm birth in an out of hospital setting, based on pragmatic interpretation of current evidence and guidelines. The aim is to enable as smooth a transition to hospital care for both baby and mother as possible. Guidance is included for those situations where initial attempts to resuscitate the baby are either not appropriate or unsuccessful.

The document describes practical interventions that can be undertaken to provide safe care and comfort to the baby until assessment and ongoing management by an appropriately experienced neonatal clinician.

Development of the guidance

A draft document was written by a Working Group co-ordinated by the British Association of Perinatal Medicine and comprising experienced paramedic, midwifery and neonatal practitioners with expertise in pre-hospital care, emergency maternity care and resuscitation of the newborn; this draft was extensively revised following wide consultation.

The Working Group considered what could safely and effectively be provided in an out of hospital environment, noting that sources for this document have been almost exclusively developed for inhospital, specialist neonatal care. It is assumed that those attending extreme preterm birth out of hospital are less likely to have expertise in preterm neonatal care and the limitations of knowledge, skills, training and equipment available to first responders in this situation are acknowledged. We are very grateful to the many people who fed back, including obstetric and nursing colleagues, families and organisations which support families.

Context

Unexpected out of hospital birth is an emergency, regardless of gestation. The initial "999" call to the emergency services will be followed by advice provided by the emergency call handlers. Labour can progress very quickly and may result in birth before the arrival of the emergency services or during their attendance, including in the ambulance.

There are additional challenges with out of hospital birth at an extremely preterm gestation. For ambulance clinicians, not only is there a need for immediate assessment of the mother and the potential complexity of the birth, but there may also be a requirement to provide critical care to a tiny, extremely preterm baby. Since transferring the baby for in hospital care (where this is appropriate) is time critical, it is extremely unlikely that deployment of a specialist neonatal team or pre-hospital emergency team will be beneficial to care of the baby.

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V1.1 5

Pre-hospital Management of Babies Born Extremely Preterm

A Framework for Practice

National guidance exists for management of in-hospital extreme preterm birth based on UK and international experience of birth before 27 completed weeks' gestation. This hospital-based guidance recommends that decisions around the provision of potentially life-sustaining care to babies born at the threshold of survival are made following a fully informed discussion between parents and healthcare professionals [1]. In the case of unexpected extreme preterm delivery in an out of hospital setting, fully informed decision making in conjunction with the parents is almost impossible. Initial care must therefore follow pragmatic, consensus-based advice in the best interests of both mother and baby.

Currently, even in the most experienced hands and assuming optimal antenatal preparation, only one third of babies born between 22⁺⁰ and 23⁺⁶ weeks' gestation in a maternity unit co-located with a neonatal intensive care unit who are offered survival-focussed care will survive to discharge from the neonatal unit [5]. There is a significant risk of severe neurodevelopmental disability if the baby survives [1]. Outcomes will be poorer for those extremely preterm babies born out of hospital, no matter how good the initial care. It is important that both pre-hospital clinicians and families are realistic in regard to potential outcomes for the baby.

Active resuscitation ("survival-focussed care") is not recommended before 22+0 weeks' gestation [1].

Principles of care

Four principles underpin the recommended approach for paramedics and ambulance clinicians attending an out of hospital birth:

- Correct assessment be aware of and prepared for potential complications during labour and birth that might compromise outcome for either mother or baby. Determine the gestation of the baby, specifically if greater or less than 22 completed weeks. If the mother is unclear, access to maternity records if available may be helpful.
- **Correct management** provide effective and timely delivery of appropriate interventions in the mother and baby's best interests. For the majority, this will include attempted stabilisation of the baby, but for some babies, comfort-focussed care will be appropriate.
- **Correct destination** access the most appropriate neonatal and/or maternal expertise at the most appropriate location.
- Good communication extremely preterm birth will be a frightening time for both the mother and her partner as well as the attending professionals. There is a high risk that the baby will not survive, and the language used at this highly emotional time will carry lasting memories for the parents.

Correct assessment

- Summon further help if birth is imminent, this may be an additional double-crewed ambulance and/or an additionally skilled ambulance clinician. Consider if further assistance from a pre-hospital critical care team will support management and assist decision making without significantly delaying conveyance.
- Prioritise the mother, ensuring she is stable; if the mother is stable, shift focus to the impending birth of the baby.
- Be aware of and prepared for potential complications during labour and birth that might compromise outcome for either mother or baby.
- If the baby is already born, simultaneous assessment of mother and baby should be undertaken.
- Try to establish the gestation of the baby, this may be through discussion with the mother or family or by reference to any available maternity records, either hand-held or electronic.
- Prepare an area for resuscitation, off the floor if possible, and open your maternity pack and newborn resuscitation equipment. For extreme preterm birth, a preterm mask, a food-grade (or neonatal specific) plastic bag and a heated mattress should be available.
- In cases where the gestation is unknown or unclear but may be 22 weeks or more, anticipate survival-focussed care for the baby.

Correct management

If gestation is known to be less than 22 completed weeks (up to and including 21 weeks and 6 days), even if there are signs of life at birth – **resuscitation should not be attempted.** Focus on maternal care and comfort care for the baby (see below) [6].

From 22⁺⁰ weeks' gestation, or if gestation is not known, **simple interventions focussed on maintaining body temperature and supporting the airway and breathing** should be undertaken. **This is a time-critical emergency for the baby.**

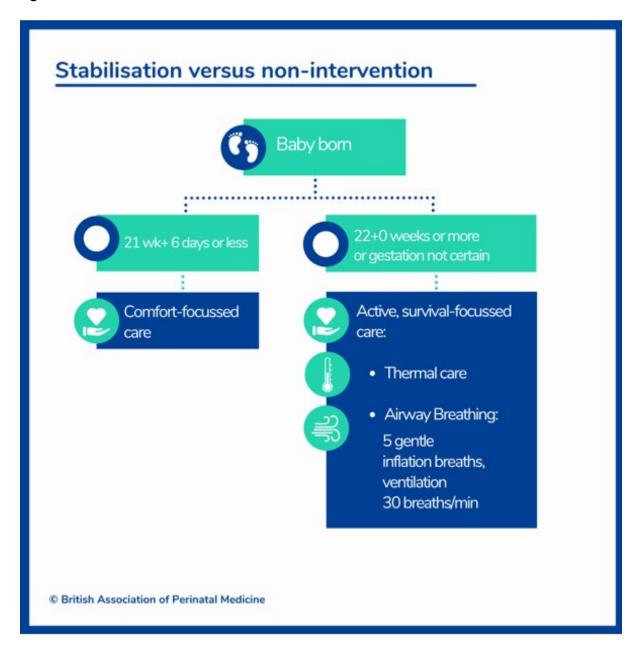
In the rare event that an advance care directive or equivalent is in place, this should be confirmed with the parents and respected. This information may be held either in paper or electronic form. © BAPM, 2022.

V1.1 7

Survival-focussed versus comfort-focussed

Initial management of an extremely preterm baby born out of hospital should follow one of two pathways; "survival-focussed" or "comfort-focussed" (palliative) care aligned to care within the hospital setting.

Figure 1 – Stabilisation versus non-Intervention



9

Survival-focussed care

Survival-focussed care of extreme preterm birth aims for the baby to be born in the best possible condition with a plan for stabilisation (including resuscitation if required) at birth [1].

For the purposes of this document, the term "survival-focussed care" means interventions for the baby intended to help to keep the baby alive and warm until more skilled neonatal assessment and ongoing management can be undertaken. It is expected that the simple interventions described below will be instigated by the attending emergency clinician(s).

Signs of life may be difficult to determine at extreme preterm birth and so in many cases it will be reasonable to commence simple interventions focussed on maintaining body temperature and supporting respiration until more highly skilled specialist neonatal help is available. If there is doubt about signs of life, commence survival-focussed care.

Three factors must be addressed:

1. Thermal care

Extremely preterm babies cannot generate heat. Heat loss will be exacerbated by evaporation of amniotic fluid from the skin of a wet baby. Thermal insulation (e.g. a blanket) will help to maintain the baby's temperature, but will not warm a cold baby. Hypothermia is associated with poorer prognosis in all babies [7]. Use warmed blankets if possible.

It should be assumed that the baby will get cold.

Consensus Statement

While there is no published evidence of benefit from the use of polythene bags in the absence of a radiant heat source, neither is there any evidence (nor expectation) of harm [8]. A polythene bag in combination with swaddling will help to prevent heat loss in extremely preterm babies born out of hospital. The baby should ideally be placed into the bag immediately after birth, and not dried beforehand. When the baby has already been dried, a polythene bag will be of less benefit, but is not predicted to cause harm and is still recommended.

- Prepare the environment for stabilising the baby on a flat surface off the floor. Identify a clean, ideally well-lit area for the imminent birth, make sure windows and doors are closed to minimise draughts. Put a heater on if available.
- At birth, the baby should be placed feet first into a polythene bag and the edges of the bag brought up to the baby's neck before immediately swaddling in a warm dry towel. Polythene wrap may be substituted for a polythene bag. Do not cover the baby's face.
- Place a hat on the baby; if not available use another head covering (e.g. an adult-sized sock).
- Place the swaddled baby on a heated mattress.
- The baby should not be dried unless there is delay in locating a polythene bag. If no bag is available, dry the baby very gently and wrap in a warm towel.
- Deferred cord clamping is recommended. Unless there is significant maternal haemorrhage and/or the mother requires urgent medical attention, do not clamp the umbilical cord until 60 seconds have elapsed since birth. Use this time to focus on placing the baby into the polythene bag up to the neck, applying a hat and wrapping with a warm towel/blanket.

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Figure 2 – Baby in a polythene bag – the baby should be placed in the polythene bag to the neck immediately after birth and before the cord is cut.



Figure 3 – Baby swaddled and hat applied. Swaddle and apply hat as soon as possible, ideally before the cord is cut.



2. Stabilisation and resuscitation applicable to extreme preterm birth out of hospital situation as per Newborn Life Support (NLS) principles [9,10]

- Take steps to ensure thermal stability during the period of deferred cord clamping (see above).
- Maintain the head in neutral position and provide jaw support.
- Stimulate the baby gently to breathe.
- Undertake a brief assessment of breathing and heart rate, using a stethoscope.
 - Baby crying vigorously/making good breathing efforts no respiratory support required
 - Poor or absent respiratory effort provide respiratory support
 - No heart rate and no respiratory effort baby may not be alive, but still proceed to provide respiratory support
- Respiratory support: use the smallest mask available; two-person support is best if this can be achieved. Provide 5 gentle inflation breaths, sustained over 2-3 seconds and then gentle ventilation breaths at approximately 30 breaths per minute in room air. Maintain baby's head in neutral position.
- An adequate heart rate (> 100 beats per minute (bpm)) can be taken as an indicator of
 effective ventilation. Chest wall rise may be difficult to determine and assessment of this
 would necessitate unwrapping the baby with risk of heat loss.
- Continue airway/breathing support in air until arrival at destination unless the heartbeat is persistently undetectable (see below).
- Do not unwrap the baby to examine; auscultation of heart rate over the polythene bag and under the blanket is sufficient.
- In the event of a very slow (< 60 bpm) or undetectable heart rate despite appropriate airway and breathing support, chest compressions are unlikely to be helpful and are not recommended below 24⁺⁰ weeks' gestation. It is very likely that the baby will not survive (see below).
- For more mature babies or where gestation is not known and potentially more than 24 completed weeks, NLS guidance should be followed [3,4]. If the heart rate remains very slow after 30 seconds of adequate ventilation proceed to chest compressions in a ratio of 3:1 with ventilation, 30 cycles per minute. Reassess baby every 2-3 minutes while striving to *maintain temperature*.

Figure 4 – Bag mask ventilation (head in neutral position)



3. Transit to definitive care

- Once initial resuscitation has taken place and if the decision is for continuing support and transfer, move baby and mother to the ambulance. Continue uninterrupted. airway/breathing support. This will most easily be achieved on a flat surface; effective administration of ventilation breaths is extremely difficult to achieve with the baby being cuddled and/or held in skin to skin contact.
- Optimise thermal care:
 - Keep baby swaddled and on a heated mattress.
 - o Maximise ambient ambulance temperature and minimise draughts.
- Continue mask ventilation and assess heart rate at 2-3 minute intervals to guide continuing intervention.
- Where the mother is unstable a second ambulance team will be required.
- Place an early pre-alert information call to the agreed destination.

A heated mattress as well as a food grade (or clinical grade) polythene bag are essential in effectively managing the birth, stabilisation and resuscitation of an extremely preterm baby in the out of hospital setting. Oxygen saturation and ECG monitoring are unlikely to be beneficial unless a prehospital critical care team is in attendance and are therefore not recommended.

Use a heated mattress with care – the baby must be wrapped in a towel or blanket in contact with the correct side of the mattress. Direct contact with the mattress will lead to skin damage and potential hyperthermia.

Baby does not appear to respond to resuscitation

- Where no heartbeat is detectable with a stethoscope on at least two occasions 10 minutes apart and arrival at the destination is not imminent, it is reasonable to reconsider attempts to resuscitate the baby if parents are in agreement with reorientation of care (see below).
- Otherwise continue with ventilation breaths at a rate of 30 breaths per minute until arrival at destination where a decision can be made by the receiving medical team on the appropriateness of continued support.

It is acknowledged that delivering sustained effective airway and breathing support in the out of hospital setting, and during conveyance to hospital is significantly challenging.

Even in the most experienced hands, the majority of babies born at $22^{+0} - 23^{+6}$ weeks' gestation in a maternity unit co-located with a neonatal intensive care unit will not survive to discharge [2].

Comfort-focussed (palliative) neonatal care

Where a joint decision has been agreed with parents that the prognosis is likely to be so poor that survival-focussed management of the baby is not appropriate (e.g. where the gestation is less than 22 completed weeks or an advance care directive is in place) comfort-focussed (palliative) care should be instigated if the baby survives labour and birth. Good palliative care for the baby and their family will provide families with much comfort in the days and weeks following their baby's death.

When comfort-focussed care is agreed, parents should be made aware that their baby may show signs of life after birth, including visible heartbeat, gasping and/or movement of limbs [6]. The parents should be given time together with their baby, with or without other family members as per their wishes and facilitated to be actively involved in their baby's care. This should include holding the baby, either skin to skin or swaddled, depending on their preference, and other memory making. A family blanket or a "cuddle pocket" (Figure 5) may help the parents in holding and comforting their baby with dignity. Remember to offer the parents an opportunity to take photographs. The other parent and/or family members should be facilitated to be with the mother and her baby, recognising that travel in the ambulance will not always be appropriate.

If a midwife is in attendance and the mother stable, the family may prefer to remain at home, otherwise mother and baby should be transported together to maternity care as soon as it is safe to do so. If the mother does not wish to hold her baby, wrap the baby in a soft towel from a maternity pack or a family blanket (or "cuddle pocket" if available), according to parental preference and suggest that either the father or baby's other parent (if possible) or a health care professional carry the baby during transfer to hospital. The parents may wish to see or hold baby at a later time; respectful care of the baby as well as the parents will be a comfort.

For particularly long journeys, when simple interventions focussed on maintaining body temperature and supporting respiration have not resulted in improvement in heart rate, comfort-focussed care may also be appropriate, depending on parental preference (see above).

Figure 5 – Cuddle pocket



Figure 6 – Extremely preterm infant 20 – 22 weeks' gestation



Correct destination

In keeping with other highly specialised areas, neonatal expertise is concentrated in specialist centres to achieve the highest standards of care. All areas/networks should work with their local maternity and neonatal services to develop a pathway for transfer of extremely preterm infants born out of hospital that aims to optimise the care that can be delivered for mother and baby at the agreed destination. The priorities are the health of the mother, availability of neonatal expertise for care of the extreme preterm baby and keeping mother and baby together. Prioritisation of on-site maternity and neonatal/paediatric facilities may involve bypassing a closer facility. The precise destination in the facility should be agreed and clear to all; we recommend a labour ward in preference to an emergency department if possible. Ambulance clinicians should be supported in circumstances where the nearest facility is bypassed in the interests of baby and/or mother.

Mother and baby should be transported together; where this cannot be achieved (e.g. unstable mother requiring ongoing support with a separate crew) mother and baby should, whenever possible, be transferred to the same facility and mother/baby separation minimised.

An early pre alert call should be made to the receiving location to enable a team to be ready for the baby and the parents.

Communication

Effective communication at this challenging time can help to reduce the impact of a traumatic experience upon parents, both in the short and longer term. Words such as "babies born before 22 weeks of gestation are small and their lungs and other organs are not developed enough for them to live after they are born" can be helpful [1,3]. This also applies to some babies born after 22 weeks of pregnancy where survival is not always possible.

Acknowledge that the loss of a baby at an extremely preterm gestation, even if they are born showing no signs of life, will be as keenly felt as a loss later in pregnancy. National guidance exists to support professionals in offering palliative and bereavement care, with helpful suggestions around language and practice [1,6,9-12].

- Avoid medical jargon, explaining in simple language.
- Be sensitive to the language the parents use; if they refer to the baby as "baby", then mirror their terms.
- Do not use the terms "abortion" or "miscarriage", this is insensitive and inappropriate.
- Avoid trying to minimise the loss or starting sentences with "at least".

A leaflet produced by Sands is very helpful (Appendix B).

Birth and death certification and registration

Where birth takes place before 24 completed weeks' gestation, the baby will be classified as a neonatal death if signs of life have been present at birth or as a late fetal loss if no signs of life were present at delivery. In determining signs of life, you are referred to the MBRRACE-UK Signs of life guidance [6].

Staff support

Clinicians attending emergency preterm births in the pre-hospital setting can often be emotionally affected by the experience. Support and multidisciplinary debrief sessions following such incidents help to ensure learning and prevent emotional trauma. Staff should be signposted to support services within their place of work and externally for further support if required. Hospital staff should be aware of, and sympathetic to, difficult decisions that may have been made before arrival and any disagreements discussed sensitively at a later debrief.

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Appendix A - Visual summary

Pre-hospital management of babies born extremely preterm: A Framework for Practice.

Assessment

- Prioritise maternal health: Is the mother stable?
- If possible, establish gestation to determine pathway.

Up to and including 21+6 weeks' gestation: Comfort focused care

Support parents to provide comfort care and ease their emotional distress

- · Encourage parents to provide comfort for their baby if they feel able to
- · Where they do not feel able ensure a crew member provides care
- · Reassure that occasional gasping or reflex movements of limbs do not indicate distress
- Help parents to give close comfort and cuddling to keep baby warm and secure
 - Skin to skin contact where possible. Plastic bag wrapping is not appropriate
- · Facilitate memory making for parents prior to and during conveyance

Destination

· Prioritise health of the mother

From 22+0 weeks' gestation, or if gestation is unclear: Survival focused care

1. Optimise ambient temperature Baby will get cold

→ Baby Will get col

2. Defer cord clamping

3. Maintain baby's heat

- Place feet-first in a polythene bag up to the neck immediately after birth
 - Do not dry beforehand
- Hat and warm blanket over polythene bag Place swaddled baby on a heated mattress if available

4. Maintain airway/breathing

- Neutral position, gentle stimulation
- Airway/breathing support
 - 5 gentle inflation breaths, then ventilation breaths -
- 30/minute
 - Preterm face mask, room air
- Increasing heart rate best indicator of lung inflation
- Do not unwrap baby to reassess

5. Chest compression

- → Not indicated below 24 weeks' gestation
- 6. Consider reorientation of care
- Where absent heart rate despite airway support, and destination not imminent If in doubt, continue ventilation breaths until arrival

Destination

- · Keep mother and baby together if possible
- Priorities are health of the mother and neonatal expertise for the baby
- Labour ward generally preferred over Accident and Emergency department
- Make sure destination aware of imminent arrival and circumstances.

Communication

Ensure empathetic and honest communication







Appendix B – Sands leaflet

https://sands.org.uk/sites/default/files/R%26P TopTipsforDoctors Handout 04.pdf





Neonatal care: end of life conversations

Doctors can have a positive influence on how parents and families experience their care even if their baby dies.

Parents often replay every detail of what happened around their baby's death and in the following weeks. This information was created with parents to support doctors on the Neonatal Unit to support them when having conversations with parents about limiting lifesustaining treatment in the neonatal unit.

Good communication can't take away the pain parents and families feel but it can reduce the impact of trauma, both in the short and long term.

Team Wellbeing

The death of a baby can have a profound and stressful impact on the staff who cared for the baby and family.

It's important to remember your own wellbeing and consider that of your team. Make time for reflection and to debrief, focus on learning lessons and not blame. You and your team members may need support, be kind to yourself and your team and remember self-care.

Sands' helpline is for anyone affected by the death of a baby, including health care professionals.

Communicate Sensitively



Consider the setting

Consider the setting where you talk to families. Ensure the room is private, quiet and comfortable. Consider putting up a screen so equipment is out of sight, make tissues available and use a well-lit room.



Introduce yourself

Introduce yourself: "Hello, my name is..."



Use the baby's name



Ask the parents preference

Ask whether the parents would prefer to be called by their first names, or 'mum' and 'dad'



Speak gently and kindly, conveying compassion



Sit down, use eye contact, and do not rush



Express understanding

Express understanding for the enormity of the situation and your sympathy and regret. Say "I'm sorry"

Communicate Clearly



Take time

Take time to gather your thoughts and be well informed about all options available



Be gentle, clear and honest



Avoid too much medical terminology



Consider your language

Ensure that parents understand what is being presented to them



Be clear about next steps

Be clear about next steps for example what will happen once care is withdrawn



Listen carefully

Listen carefully to what parents say, and try to answer questions clearly and honestly

Support

t: 0808 164 3332

e: helpline@sands.org.uk Download the app at sands.org.uk/app

Enquiries

t: 0207 436 7940 e: info@sands.org.uk

sands.org.uk







Leading Excellence in Perinatal Care

This document was produced by the British Association of Perinatal Medicine (BAPM).

BAPM a membership organisation that is here to support all those involved in perinatal care to optimise their skills and knowledge, deliver and share high-quality safe and innovative practice, undertake research, and speak out for babies and their families.

We are a professional association of neonatologists, paediatricians, obstetricians, nurses, midwives, trainees, network managers and other health professionals dedicated to shaping the delivery and improving the standard of perinatal care in the UK.

Our vision is for every baby and their family to receive the highest standard of perinatal care. Join us today.

www.bapm.org/join