British Association of Perinatal Medicine

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

A Framework for Practice

DRAFT FOR CONSULTATION

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In collaboration with

COLLEGE OF paramedics
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Contents

Summary

The unplanned birth of an extremely preterm baby in an "out of hospital" setting is a challenging situation, even for experienced emergency practitioners and ambulance crew.

This consensus document provides guidance to staff attending extreme preterm birth in an out of hospital situation. It 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, and revised following wide consultation.

The document aligns with other UK guidance around extreme preterm birth and resuscitation of the newborn - acknowledging the lack of published evidence to guide practice and limitation of skills and equipment available, it offers a pragmatic approach to the management of unexpected extreme preterm birth in an out of hospital setting.

Outcomes for extremely preterm babies born out of hospital are poorer than for those babies of equivalent gestation born in the appropriate hospital setting and in reality only a minority of babies born out of hospital before 24 completed weeks' gestation will survive [1]. Attempted resuscitation of the baby before 22 completed weeks' gestation will be futile and should not be undertaken. The importance of consistent, empathetic and professional care in helping parents come to terms with the trauma of extreme preterm birth, even if the baby does not survive, cannot be underestimated.

This document is intended to be fully inclusive; the words baby, pregnant person, mother, partner 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 support pre-hospital clinicians attending an unplanned extreme preterm birth in the out of hospital setting. Preterm birth is a continuum and accurate gestation may not be known; for these reasons, this document does not cover a precise gestational period.

Paramedics are the only professional with a pre-registration education in Pre-Hospital emergency care. Other clinicians attending may be a doctor with additional training in pre-hospital emergency medicine and non-registered emergency care providers.

Purpose

To provide a practical framework based on pragmatic interpretation of current evidence and guidelines for managing extreme preterm birth in the out of hospital setting, enabling a smooth transition to hospital care for those extreme preterm babies for whom ongoing neonatal care is appropriate. Equally importantly, guidance is offered for those situations where initial attempts to resuscitate, or ongoing resuscitation, is not appropriate.

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

The working group considered what could be safely and effectively provided in the pre-hospital environment, noting that sources for this document have been almost exclusively developed for in-hospital, specialist neonatal care. It is assumed that those attending extreme preterm birth out of hospital are unlikely to have expertise in preterm neonatal care. The limitations of knowledge, skills, training and equipment available to emergency services provider and to clinicians in the ambulance service are acknowledged.

Context

Currently, even in the most experienced hands and assuming optimal antenatal preparation, fewer than one third of babies born at 22+0 – 22+6 weeks' gestation in a maternity unit co-located with a neonatal intensive care unit and offered active survival-focussed care will survive to discharge from the neonatal unit [2] . Outcomes for extremely preterm babies born in an out of hospital setting will be poorer than for those babies of equivalent gestation born in the appropriate hospital setting [1].

Whilst most babies are born in hospital, emergency services in the UK manage calls for unexpected out of hospital births. Unexpected, out of hospital birth is an emergency, regardless of gestation. The initial "999" call to the emergency services followed by advice provided by the emergency call handlers will be a time of intense trepidation and distress.

Labour can progress very quickly, often resulting in birth before the arrival of the emergency services or during their attendance.

When birth happens at an extremely preterm gestation (prior to 27 completed weeks' gestation), there are additional challenges. For ambulance clinicians, not only is there a need for immediate assessment of the mother, but there may also be a requirement to provide critical care to a tiny newborn baby in an out of hospital setting. National guidance in regard to management of extreme preterm birth focusses on in-hospital births and is based

around UK and international experience of preterm birth before 27 completed weeks' gestation. That hospital-based guidance recommends that decisions around the provision of potentially life-sustaining care to babies born at the borderline of viability are made following a fully informed discussion between parents and healthcare professionals [1]. In the case of unexpected extreme preterm delivery in the out of hospital setting, fully informed decision making in conjunction with the parents is almost impossible and professionals attending the birth are very unlikely to have expertise in preterm neonatal care. Pragmatic decisions must therefore be made.

Outcomes for preterm infants at the borderline of viability are improving but there remains a significant risk of death or severe neurodevelopmental disability which will be exacerbated by unplanned out of hospital birth, no matter how good the initial care. It is important that the expectations of both pre-hospital clinicians and families are realistic.

Gestation should not be the sole criterion for planning management of extreme preterm birth, but it is widely accepted that "active" (survival-focussed) care is not appropriate before 22+0 weeks' gestation [1].

Principles of care

Three principles underpin the recommended approach:

- **Correct assessment** – determining the gestation of the baby; is the gestation 22 completed weeks or more? Access to maternity records will assist if available.
- **Correct management** – effective and timely delivery of simple interventions dependent upon gestation and condition at birth. Appropriate management may include attempted stabilisation of the baby or non-active intervention (comfort care).
- **Correct destination** – Access the most appropriate available neonatal expertise at the appropriate location.

An early pre alert information call should be made to the receiving location to enable a team and facilities to be made ready for the arrival of the ambulance clinicians, baby, mother, and family. Upon arrival of the ambulance clinicians at the location where the pregnant patient is birthing the baby, follow the principles:

Correct assessment

- Summon further help if birth is imminent, this may be an additional double-crewed ambulance, but consider if further assistance will support the management of the clinical scene and assist decision making.
- Prioritise the mother, ensuring she is stable enough for the focus to move to the impending birth of the baby, or the baby if already born.
- Try to establish the gestation of the baby, this may be from 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, newborn resuscitation equipment, and a food-grade (or neonatal specific) plastic bag. Consider an exothermic mattress and preterm masks.
- In cases where the gestation is unknown, assume active management of 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 will be futile and should not be attempted.** Focus on comfort care (see below)

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, ideally with parental involvement. In the rare event that an "advance care directive" is in place, this should be respected. **This is a time-critical emergency for the baby.**

Correct destination

Each area should agree a pathway to determine the most appropriate destination for the baby and mother; the priorities are neonatal expertise available for care of the extreme preterm baby and keeping mother and baby together whenever possible. These priorities may be conflicting. Options may include direct admission to a labour ward or an Emergency Department with maternity facility. The closest facility may not be most appropriate

destination. 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.

Stabilisation *versus* non-intervention

Initial management of extreme preterm birth in the out of hospital setting should follow one of two pathways; "palliative, comfort-focussed" or "active, survival-focussed" aligned to care within the hospital setting.

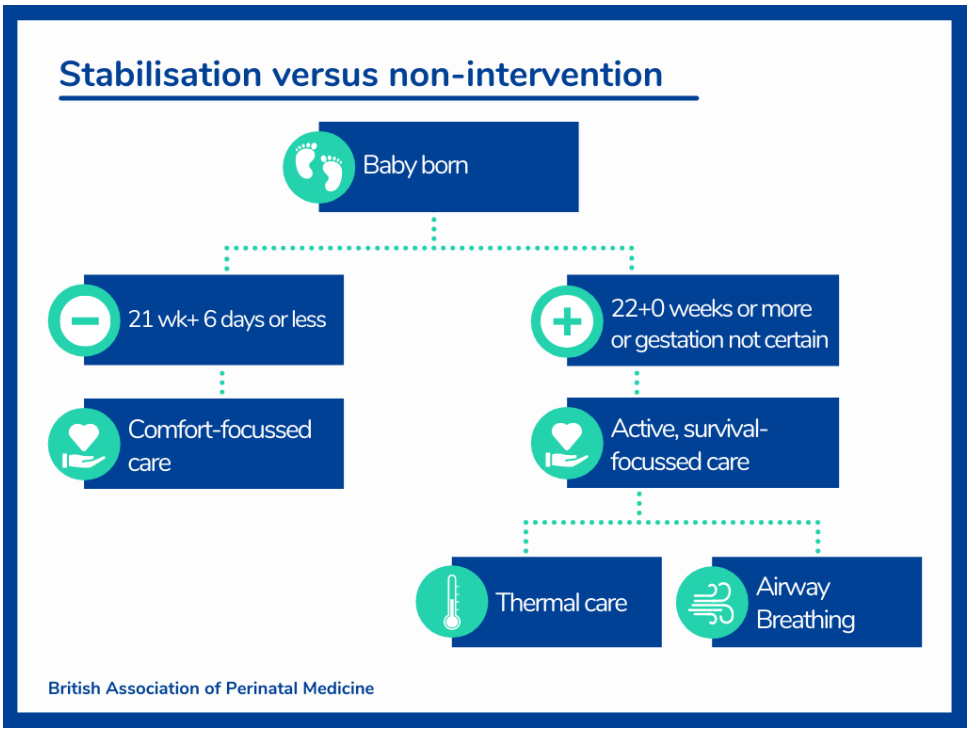

Figure 1 - Stabilisation versus non-intervention

Palliative (comfort-focussed) care

Where a joint decision has been agreed with parents that the prognosis is likely to be so poor that such active management is not appropriate, (e.g. where the gestation is less than 22 completed weeks or an advance care directive is in place) any intervention should only be in the maternal interest and palliative (comfort-focussed) care instigated if the baby survives labour and birth. Good palliative care should be actively provided for the baby and their family. There are many resources available to facilitate palliative care, including Together for Short Lives [3]. The baby should be kept with the mother and the two transferred together as soon as reasonably practical to a maternity setting.

Active, survival-focussed care

Active, 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.

For the purposes of this document, the term "active care" will be taken to mean interventions for the baby intended to help to keep the baby alive and warm until more skilled neonatal assessment can be undertaken. It is expected that the simple interventions described below will be instigated by the attending emergency clinicians.

Active neonatal care:

Three factors must be addressed:

1. Thermal care

Extremely preterm babies cannot generate heat and heat loss will be exacerbated by evaporation of amniotic fluid from the skin. Thermal insulation (e.g. a warm blanket) will help to maintain the baby's temperature, but will not warm a cold baby. **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 at these extreme preterm gestations, a polythene bag in combination with swaddling will help to prevent heat loss in extremely preterm babies born out of hospital. The baby does not need to be dried before being placed into the bag

Figure 2 – A baby in a polythene bag

- Prepare the environment, off the floor, on a flat surface. 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 food grade polythene bag and immediately swaddled in a warm dry towel without drying. Polythene wrap may be substituted for a polythene bag.
- Bring the edges of the bag up to the baby's neck and place the swaddled baby on a heated mattress if available*.
- There is no need to dry the baby unless there is delay in locating a bag.
- Place a hat on the baby; if not available use another head covering (an adult-sized sock may be suitable). (Figure 3)
- Delay the clamping and cutting of the umbilical cord for at least 60 seconds after the birth of the baby. Use this time to focus on placing the baby into the plastic bag, apply a hat and wrap with a warm towel/blanket.
- Undertake an assessment of breathing and heart rate – use a stethoscope.

Figure 3 – a mannequin in a polythene wrap and sock

Remember:
An exothermic mattress (e.g. transwarmer™) should be considered an essential piece of equipment in effectively managing the birth, stabilisation and resuscitation of the preterm infant in the out of hospital setting.

2. Stabilisation and resuscitation as per NLS principles [4,5]

- Do not clamp the umbilical cord clamping until at least 60 seconds after delivery. - Take steps to ensure thermal stability during this period (see above).
- Maintain the head in neutral position and provide jaw support.
- Undertake a brief assessment of breathing and heart rate, using a stethoscope.
- 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 (if there is an adequate heart rate response) ventilation breaths at approximately 30 breaths per minute in room air.
- An adequate heart rate (> 100 beats per minute) can be taken as an indicator of effective ventilation.
- Do not unwrap the baby to examine; auscultation of heart rate over the polythene bag is sufficient.
- Continue airway/breathing support until arrival at destination.
- In the event of a persistent very slow 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.

3. Transit to definitive care

- Once initial resuscitation and stabilisation 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.
- Optimise thermal care:
    - Keep baby swaddled and on a heated mattress if available.
    - Maximise ambient ambulance temperature and minimise draughts.
- Continue mask ventilation and assess heart rate to guide continuing intervention. Out of hospital oxygen

saturation is tricky to apply to the smallest babies, may not be available and therefore will not take priority. Similarly, adult or child ECG leads will be difficult to apply, and may damage the friable skin of extremely preterm infants.

- Ensure a pre-alert information call to the agreed destination.

Remember:
It is acknowledged that delivering sustained effective airway and breathing support in the out of hospital setting, and during conveyance to hospital will be significantly challenging. Whilst best efforts should be made, a pragmatic approach remains important. When the heart rate remains slow despite best efforts, oxygen may be administered.

Apparent futility of resuscitation

- Where no heart beat is detectable with a stethoscope for a period of 10 minutes and arrival at the destination is more than 20 minutes ahead, it is reasonable to discontinue attempts to resuscitate the baby, if parents are in agreement with this course of action.
- 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 (or midwifery) team on the appropriateness of continued support.

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

Palliative, comfort-focussed neonatal care

Good palliative care provided with empathy will provide families with much comfort in the days and weeks following their baby's death. It is recognised that 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.

When gestation is known to be less than 22 completed weeks (*i.e.* up to and including 21^{+6} weeks' gestation), the prognosis is so poor that active, survival-focussed care **is not appropriate** and palliative care should be adopted from the point of birth. 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]. They should be offered the opportunity to hold the baby, either skin to skin or swaddled, depending on their preference, and given time together, with or without other family members as per their wishes. A "cuddle pocket" **(Figure 4)** or a family blanket may help the parents in holding and comforting the baby with dignity.

Figure 4 - A 'cuddle pocket'

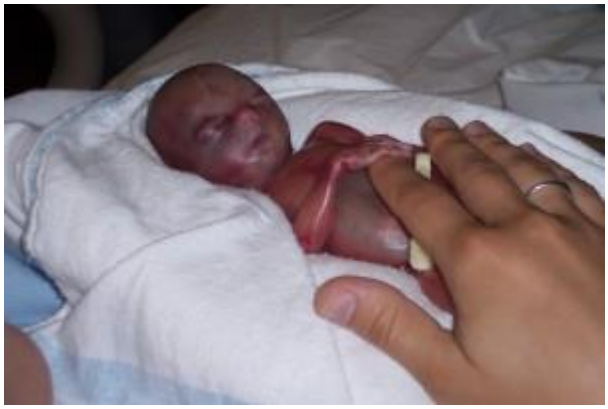

Figure 5 - A baby receiving comfort care

Mother and baby should then 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 "cuddle pocket" if available) and suggest that either the partner or a health care professional carry the baby during transfer to hospital. The mother may wish to see or hold or baby at a later time; respectful care of the baby as well as the parents will be a comfort.

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

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].

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 care, with helpful suggestions around language and practice [3,7].

Words and language used at this highly emotional time will have a lasting memory for the parents; the following is helpful:

- Avoid medical jargon, explaining in simple language
- Be sensitive to the language the mother uses; if she refers to the baby as “baby”, then mirror her terms.
- Do not use the term “abortion” or threatened, missed or incomplete abortion, this is inappropriate and insensitive.
- Avoid trying to minimise the loss or starting sentences with “at least”.

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].

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