

British Association of Perinatal Medicine

The Management of Babies born Extremely Preterm at less than 26 weeks of gestation

A Framework for Clinical Practice at the time of Birth

Report of a Working Group

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Introduction

Management of the delivery of an extremely preterm baby is one of the most challenging aspects of perinatal medicine. The ethical, social, economic and legal issues have recently been reviewed by the Nuffield Council on Bioethics.¹ The professions and advocates for parents were encouraged to consider the pattern of care appropriate for babies born before 26 weeks' gestation based on the best information currently available. There are limitations to contemporary evidence, particularly in terms of predicting outcome after the shortest of pregnancies. While recognising these limitations, and although every pregnancy is different, some general principles can be described.

This is not a set of instructions, but a framework to highlight the range of evidence and opinion that needs to be considered by staff and parents. Care of the mother, her fetus and the baby, will always need to be individualised and should be led by senior staff in all disciplines. The parents' hopes and expectations need to be explored with honesty and compassion in a realistic way, drawing upon the available evidence. Communication and agreed plans must be documented in full and signed legibly. These plans may need to be revised frequently.

Before delivery

When it appears that a mother will deliver her baby at a very early gestational age there is important clinical information that needs to be carefully reviewed. Accurate information will greatly assist the dialogue and inform the decisions made. Whenever possible ante-natal management decisions should involve both of the parents and the clinical staff who will be responsible before and after the delivery.

The obstetric history and antenatal care must be considered carefully with particular attention to the ultrasound dating scan(s). The earlier this has been carried out the more accurately the gestational age will be known.² Other information about fetal growth or abnormalities may be available from the scan(s). The best estimation of gestational age should be agreed with the parents. A record of the discussion must be made and revised according to any changes in condition of the fetus or mother.

Discussion with the parents must include information about the expected outcome based on the best available local and national population data. Care must be taken in interpreting local hospital statistics which, at very low gestational ages, will be based on small numbers even in the largest centres.

The practicalities of commencing, withholding and withdrawing intensive care, and the positive role of palliative care where appropriate, should be described to the parents. This will help prepare them for the different possible outcomes after delivery.

Parents may find the advice and support of their family, friends and spiritual advisers to be of great value at this time.

Assessment of the local neonatal unit staffing and capabilities must be made. Transfer to another hospital, increasingly within a managed clinical network, should be discussed if this is clinically appropriate. Written information, which includes this possibility, should be given to all parents at the time of booking.

If time allows, the parents should be offered the opportunity to visit the Neonatal Unit.

Management recommendations (see also Appendix 1)

Based on the best assessment of gestational age, as well as information about the well being of the fetus and the wishes of the parents, a clear plan for delivery and care of the baby must be made and documented. This will need to be reviewed regularly.

Discussion about the mode of delivery should include an explanation of the maternal morbidity in future pregnancies associated with a classical Caesarean section when carried out at very early gestational age. However this may be necessary for maternal indications.

If active obstetric intervention in the interests of the fetus is not planned, continuous monitoring of the fetal heart rate is not advised. However the parents should be made aware that their baby may show signs of life for a variable time after birth and intermittent assessment of the fetus by a Doppler device or auscultation is useful to the professionals responsible at the time of birth.

Resuscitation at birth

Preterm labour often progresses rapidly. In these circumstances there may be insufficient time to hold a detailed discussion with the parents before the baby is born. A decision about resuscitation may need to be made based on the most recent management plan, if any, and the available clinical information. When lung inflation with a mask is an appropriate initial approach, this should be carried out as described in the Newborn Life Support course handbook.³

A Framework for Clinical Practice based on consensus and the most recent evidence available follows:

(A) LESS THAN 23+0 WEEKS

If gestational age is **certain** and less than 23+0 (i.e. at 22 weeks) it would be considered in the best interests of the baby, and standard practice, for resuscitation not to be carried out. If the parents wish they should have the opportunity to discuss outcomes with a second senior member of the perinatal team.

In the EPICure study of all babies born in 1995 in the UK and Eire at <26 weeks gestational age, only two babies reported at <23 weeks survived to discharge and one has severe disability.⁴

In the EPICure 2 study (2006) survival remains extremely rare at this gestational age, with a high incidence of early major morbidity in the few who are discharged home.⁷

(B) 23+0 to 23+6 WEEKS

If gestational age is **certain** at 23+0 – 23+6 (i.e. at 23 weeks) and the fetal heart is heard during labour, a professional experienced in resuscitation should be available to attend the birth. In the best interests of the baby a decision not to start resuscitation is an appropriate approach particularly if the parents have expressed this wish. However, if resuscitation is started with lung inflation using a mask, the response of

the heart rate will be critical in deciding whether to continue or to stop and sensitively explain to the parents the futility of further interventions.

The EPICure study (1995) reported in 2000 that at 23 weeks 121/241 (50%) of live born babies were admitted for intensive care of whom 105 (80%) died in hospital.⁴ 26 babies were discharged home, one died and 14 (54%) have a moderate or severe disability at six years,^{5 and Appendix 3} Early findings in the EPICure 2 study (2006) show that at this gestational age survival has not increased significantly and there has been no change in early major morbidity.⁷

(C) 24+0 to 24+6 WEEKS

If gestational age is **certain** at 24+0 – 24+6 resuscitation should be commenced unless the parents and clinicians have considered that the baby will be born severely compromised. However the response of the heart rate to lung inflation using a mask will be critical in deciding whether to proceed to intensive care. If the baby is assessed to be more immature than expected, deciding not to start resuscitation may be considered in the best interest of the baby.

In the 1995 study⁴, although 313/382 (78%) of babies born at this gestational age (313) were given intensive care, 198 (66%) died.³ Half of the survivors (52) have a moderate or severe disability at six years.^{6 and appendix 3} Early findings in the EPICure 2 study (2006) show that at this gestational age survival has increased significantly by 12%. More babies were treated for retinopathy of prematurity but there is no evidence of any change in other early major morbidity.⁷

(D) 25 WEEKS AND GREATER

When gestational age is 25⁺⁰ weeks or more, survival is now considerably greater than in 1995. It is appropriate to resuscitate babies at this gestation and, if the response is encouraging, to start intensive care.

In the 1995 study⁴ 389/424 (92%) babies born alive at 25 weeks were admitted for intensive care but 171 (48%) died.³ 27% of the survivors had no identifiable impairment at six years.⁶ In 2006 survival had increased significantly from 54% to 67% by 13%, but there is no evidence of any change in early major morbidity.⁵

(E) UNCERTAIN GESTATIONAL AGE

If gestational age is uncertain, (i.e. no dating ultrasound scan) but thought to be $\geq 23+0$ weeks, an ultrasound scan by an experienced sonographer should be carried out if time permits. If the fetal heart is heard during labour, a professional experienced in resuscitation and another clinician (neonatal nurse or trainee paediatrician) should be called to attend birth. A decision should then be made, in the best interests of the baby, as to whether resuscitation should begin with mask ventilation. Once begun, the response of heart rate to lung inflation will be crucial in judging how long to continue resuscitation. If there is any uncertainty about management guidance from more senior staff should be sought urgently.

Intensive care

The response of the baby to mask ventilation is critical in deciding whether to commence intensive care. If the heart rate increases rapidly and the colour improves, appropriate ventilatory support, including intubation and surfactant therapy, should be given and the baby transferred to the neonatal unit for further assessment.

There is no evidence to support the use of adrenaline by any route, or chest compressions, during resuscitation at gestational age <26 weeks.⁸

Management should be decided by doctors and nurses experienced in neonatal intensive care.

Withholding or withdrawing resuscitation or intensive care

When resuscitation or intensive care is withheld or withdrawn, the baby should be given all the care needed for his/her comfort and the parents encouraged by appropriate staff to hold and spend time with their baby, if they wish, in a quiet and private location.

Further recommendations may be found in a RCPCH monograph on withholding or withdrawing life sustaining treatment.⁹

When a baby dies the parents should be offered bereavement counselling, including advice about post mortem examination. At an appropriate time the prognosis for future pregnancies should also be discussed.

Further reading

1. Critical care decisions in fetal and neonatal medicine: ethical issues. Nuffield Council on Bioethics 2006 www.nuffieldbioethics.org
2. NICE Evidence Based Clinical Guideline: Antenatal Care Routine Care for the Healthy Pregnant Woman October 2003, 1.2.6 Gestational age assessment: LMP and ultrasound 4.6:34 <http://www.rcog.org.uk/index.asp?PageID=693>
3. Newborn Life Support. Resuscitation at Birth. Resuscitation Council (UK) 2nd Ed. 2006 www.resus.org.uk
4. Costeloe K, Hennessy E, Gibson AT, Marlow N, Wilkinson AR, The EPICure study: Outcome to discharge from hospital for infants at the threshold of viability. Pediatrics 2000;**106**:659-671.
5. Wood NS, Marlow N, Costeloe K, Gibson AT, Wilkinson AR for the EPICure Study Group. Neurologic and developmental disability after extremely preterm birth. N Engl J Med 2000; **343**: 378 -84
6. Marlow N, Wolke D, Bracewell M, Samara M, for the EPICure Study Group. Neurologic and Developmental Disability at 6 Years of Age after Extremely Preterm Birth. N Engl J Med 2005; **352**: 9 -19
7. EPICure 2 Perinatal Group. Survival and early morbidity of extremely preterm babies in England: changes since 1995. Arch Dis Child 2008; **93**:(Supp 1):A33-34
8. Sims DG, Heal CA, Bartle SM. Use of adrenaline and atropine in neonatal resuscitation. Arch Dis Child F&N 1994; **70**: F3-9.
9. Withholding or Withdrawing Life Sustaining Treatment in Children – A Framework for Practice. Royal College of Paediatrics and Child Health, 2nd Ed. May 2004.

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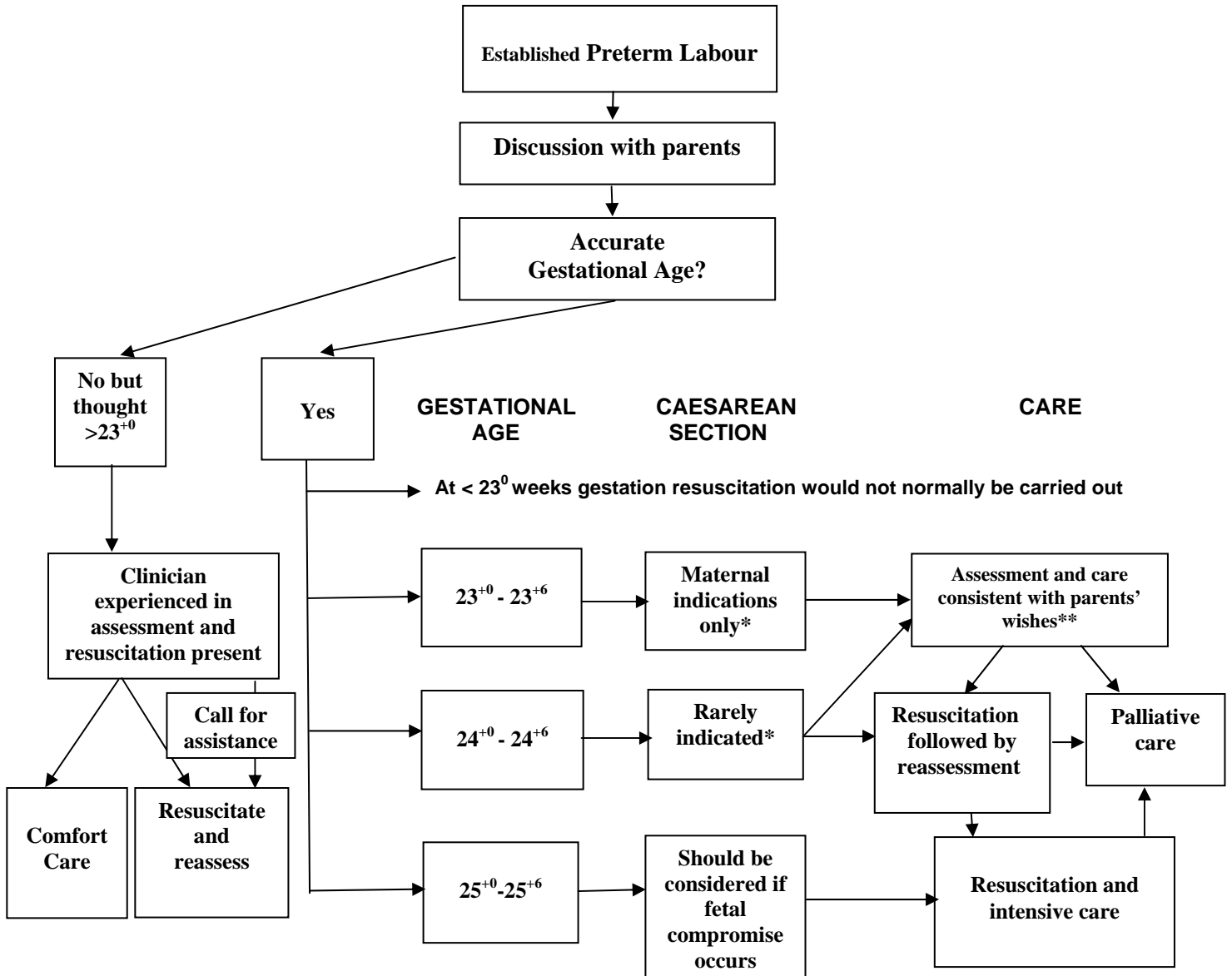
a – BAPM, b – BLISS, c – RCN, d – RCM, e – RCPCH, f – NNA, g – RCOG

Appendices

- 1 Flowchart
- 2 Suggested criteria to be taken into consideration when determining management
- 3 Published EPICure (1995) data

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* Caesarean section offers no benefit to the fetus <25 weeks' gestation and should be performed only when indicated for the health of the mother.

** Survival and outcome for infants born at 23⁺⁰ – 24⁺⁶ is poor. Management of an infant born at this gestation should be consistent with parents' wishes but decisions made before birth are influenced by the baby's condition at birth. When parents wish resuscitation the clinician's decision to resuscitate should depend on detailed assessment of the infant's condition. Objective criteria include movements, lack of bruising, presence of spontaneous respiratory efforts and response to initial resuscitation.

Appendix 2

Factors to be Taken into Account When Discussing Management with Parents

Antenatal factors influencing fetal outcome

- Gestational age
- Steroid administration
- Predicted fetal weight
- Multiple pregnancy
- Sex
- Presence and severity of pathology
 - Fetal growth restriction
 - Fetal acidaemia*
 - Sepsis
- Fetal Anomaly

* As suggested by an abnormal cardiotocograph or umbilical artery Doppler flow velocity waveform (particularly absent or reversed end diastolic frequencies).

Parental factors

- Cultural
- Religious
- Medical
- Past obstetric history
 - Previous pregnancy loss
 - Sub-fertility

Parental Expectations

- Understanding of process
 - In-utero transfers
 - Postnatal assessment
 - Paediatric involvement/interventions
- Outcome
 - Survival
 - Morbidity
 - Their wishes

Condition of Infant at Delivery

- Apparent maturity
- Extensive bruising
- Heart rate
- Spontaneous activity level
- Respiratory effort and signs of sustained response to resuscitation

Appendix 3

Summary of outcomes for all livebirths < 26⁺⁰ weeks' gestation in UK and Ireland, March to December 1995³

N (% live births)	22w	23w	24w	25w
*Live births	138	241	382	424
*Died in delivery room	116 (84%)	110 (46%)	84 (22%)	67 (16%)
Admitted for intensive care	17 (12%)	121 (50%)	313 (82%)	389 (92%)
Survival (% live births)	2 (1.5%)	26 (11%)	100 (26%)	186 (44%)
**Gestational age reassessed ⁴	22 (16%)	131 (54%)	298 (78%)	357 (84%)
Died in NICU (% admitted)	20 (91%)	105 (80%)	198 (66%)	171 (48%)
Survived to discharge	2 (9%)	26 (20%)	100 (33%)	186 (52%)
(% of discharged babies)				
Deaths post discharge	0	1 (4%)	2 (2%)	3 (1.6%)
Lost to follow up	0	3	25	39
# Severe disability	1 (50%)	5 (23%)	21 (28%)	40 (18%)
# Moderate or mild disability	1	14 (61%)	42 (56%)	83 (56%)
Survivors without identified impairment at 6y (% live births*)⁴	0	3 (1%)	10 (3%)	35 (8%)
Survivors without identified disability at 6y (% admissions**) ⁴	0	3 (2%)	10 (4%)	35 (11%)

* Gestational age based on 'working' estimate on labour ward

** Gestational age assessed postnatally

A severe disability is defined as one that is expected to render the child dependent⁴

Note

Further early outcome data from the *EPICure 2* study of babies born <27 weeks gestational age in England in 2006 will be available later in 2008

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