

OBSTETRIC STANDARDS FOR THE PROVISION OF PERINATAL CARE

INTRODUCTION

Perinatal intensive care is a joint enterprise. It requires close co-ordination between midwives, obstetricians, neonatologists and anaesthetists¹. Quality care needs not only staff with appropriate training and expertise, but also suitable facilities and equipment. In addition, procedural mechanisms need to be in place to ensure the efficient delivery of care. The labour ward is an archetypal 'high risk area', where high level emergency care may be needed at any time of the day or night, 24 hours a day, 365 days a year. Labour remains a significant cause of death in young, otherwise healthy women²; it is a particular risk in women with pre-existing medical disorders². One in 200 babies still die in the perinatal period³. Adverse events are associated with identifiable substandard care in about 75% of cases³. This results in a massive medico-legal liability - in value terms about 2/3rds of all medicolegal awards in the NHS relate to obstetrics and/or neonatology. It highlights the need for proper staffing, facilities and organisation if problems are to be avoided.

The purpose of this document is to recommend standards for perinatal care that have been developed within the British Association of Perinatal Medicine. The standards were developed by iterative consultation between senior obstetricians and neonatologists within the Association, and complemented by consultation with the membership. The document was circulated to all members prior to the Annual General Meeting in September 1998, and comments received have been taken into account.

At the Annual General Meeting in 1998, the standards were welcomed and found general approval. The issue of the need for an evidence base was discussed. While many of the recommendations are to be found in documents already published¹⁻¹¹, few are based on prospective randomised trials or have been subject to rigorous cost/benefit analysis. They represent instead *aspirational* standards towards which the members of the Association are striving. All the standards described are practical in the sense that some units already meet them, although not necessarily simultaneously. They present the picture of a unit, which in the opinion of the Association, represents the level of current best practice, and to which we should all aspire.

Many members of the Association believe that all babies should be born with immediate availability of neonatal intensive care. However, it is recognised that not all women wish to give birth in fully equipped units, and that there are social and psychological advantages to home birth or birth in midwife or general practitioner run maternity units. We have therefore included sections to describe the standards that the Association feels should apply in these settings.

LEVEL 3 - INTENSIVE (Tertiary referral)

Perinatal intensive care provision may be sufficient to cope with temporary intensive care of babies born unexpectedly in poor condition (level 1), prior to transfer to a regional centre, or to provide the highest level intensive care for inborn babies for a limited period (level 2), or to provide care on a long-term basis both for in-born babies and for in- or ex-utero transfers referred in (level 3).

In addition, many babies needing intensive care are born to mothers who are suffering from medical disorders themselves, and the mothers may also need intensive care. Thus, any unit offering level 3 perinatal intensive care must be able to provide high level care not only for sick neonates, but also for sick mothers.

The requirements outlined below are for a level 3 unit and are over and above those expected of every maternity unit where mothers give birth. A primary pre-requisite is the presence on-site of a neonatal intensive care unit with more intensive care cots than are required solely for booked deliveries.

1. Staffing

- 2.1. At least one consultant obstetrician (and preferably more) should have a major interest in perinatal obstetrics and devote the majority of his/her working week to organising the service. There should be a multi-disciplinary team including a physician interested in obstetric medicine, obstetric anaesthetists, and midwives specialising in the care of women with medical and obstetric disorders⁴. They should have a clear responsibility for the generation of guidelines for management of high risk pregnancies, and for ensuring that they are kept up-to-date. They should also have a major input into the organisation of the delivery area, which should reflect the need for the care of a greater than average number of high risk pregnancies.
- 2.2. There should be consultant level obstetric cover for the labour ward at all times¹¹, the person designated to provide such cover should have no other fixed commitments inside or outside the hospital⁵. This requires that contracts provide for ten consultant sessions per week dedicated to the labour ward. This level of obstetric cover has already been established in most maternity units in Scotland. Consultants should have specified responsibility for the supervision of practice and training of medical staff⁵.
- 2.3. The unit must have appropriate intermediate grade medical staffing and there should be a specialist registrar or equivalent available for the labour ward at all times without other fixed commitments inside or outside the hospital.
- 2.4. There should be a fully trained obstetric anaesthetist available at all times for duties on the labour ward with no other commitments inside or outside the hospital. There should be at least one consultant notional half day attendance on labour ward per 500 deliveries¹¹.
- 2.5. At least one consultant physician should have a regular commitment to the obstetric service¹¹ and there should be clear arrangements for out of hours expertise in the management of medical disorders such as hypertension and diabetes to be available at all times.
- 2.6. Midwifery staffing on labour ward should reflect the increased workload of a level three unit and it should exceed that of an equivalent sized level two unit.
- 2.7. The arrangements for junior medical and midwifery staffing should reflect the intensity and responsibility involved in running an intensive perinatal care service. The following arrangements are essential:

Junior medical staff:

- 1.7.1. There should be an induction programme for all new staff.
- 1.7.2. There should be protected teaching time of at least one session per week.
- 1.7.3. There should be partial or full shift working that keeps hours within the nationally recommended maxima for hard-pressed posts.
- 1.7.4. Junior doctors will not be expected to undertake any procedure unsupervised which they have not been trained to do, and certified as competent to perform. There should be an induction period during which they will work from 9am to 5pm under the direct supervision of a consultant. They should be specifically trained in procedures such as cervical cerclage, cardiotocography, instrumental delivery and external cephalic version.
- 1.7.5. There will be 24 hour access to reference material (management guidelines, books, and electronic media such as the Cochrane Database, Medline and the internet).
- 1.7.6. There should be regular training sessions in the assessment of fetal condition using fetal heart rate pattern interpretation and fetal blood sampling and pH measurement. An accreditation system should be used to ensure that junior doctors do not make decisions based on their own expertise until they are qualified to do so.
- 1.7.7. There must be explicit lines of command, and access to consultant expertise 24 hours per day.
- 1.7.8. There must be an agreed programme for each member of staff to monitor their performance and to provide the opportunity for feedback. There should be mechanisms to ensure continuity of care during handovers, and to facilitate a team working approach. A defined handover time is essential.
- 1.7.9. There should be training in neonatal resuscitation and immediate care, and in the examination of the normal and abnormal newborn.

Midwifery staff:

- 1.7.10. All women should have one to one midwifery care throughout active labour.
- 1.7.11. National figures indicate an average ratio of one midwife to 35 deliveries per midwife annually, equivalent to approximately 30 midwives (full time equivalents, FTE) per thousand deliveries per annum⁵. However, the Royal College of Obstetricians and Gynaecologists (RCOG) have recommended that 50 FTE per 1,000 births is a more appropriate standard¹¹. Staffing levels in an intensive perinatal care unit should exceed the average level to a degree which can be estimated from the case mix, but should approach the RCOG recommended level.
- 1.7.12. There should be a specialised group of midwives who have particular training, experience, and expertise in the management of the sick mother^{4,11}. They should provide 24 hour cover of the labour ward, and should also attend high risk antenatal clinics. They will need regular training to maintain their skills.
- 1.7.13. There should be regular training sessions in the assessment of fetal condition using fetal heart rate pattern interpretation and fetal blood sampling and pH measurement⁵. An accreditation system should be used to ensure that midwives do not make decisions based on their own expertise until they are qualified to do so.
- 1.7.14. There should be sufficient additional manpower built into staffing levels to cover annual leave sickness, maternity leave, statutory training, and corporate training.

Ancillary staff:

- 1.7.15. There must be adequate Operating Department support¹¹ (including midwives trained in recovery techniques and operating department assistants).
- 1.7.16. There should be adequate ancillary staff support to service at least one operating theatre for every three thousand deliveries per annum.
- 1.7.17. A dedicated anaesthetic assistant should be available at all times.
- 1.7.18. There must be appropriate auxiliary support for ward areas, and out- patient departments.
- 1.7.19. 24 hour receptionist¹¹, portering services and auxiliary support should be provided.
- 1.7.20. Link workers, including interpreters, should be available to provide continuity over the interface between hospital, community, and social services departments.
- 1.7.21. Religious and spiritual advisors should be available upon request.

2. Facilities

- 2.1. There should be a post-operative recovery area with one-to-one care for at least 30 minutes, and preferably facilities for ongoing adult high dependency care within the delivery unit. These must have piped oxygen and suction and appropriate patient monitoring equipment including pulse oximetry, ECG, and both direct and non-invasive blood pressure monitors¹¹. There must be a properly equipped resuscitation trolley. There should be regular training for midwives in high dependency care, and their skills should be audited regularly.
- 2.2. There should be ready access to adult intensive care.
- 2.3. There must be at least one dedicated obstetric operating theatre per 3,000 deliveries. The theatre should be on the same floor as the delivery suite, and in close proximity, and staffed and equipped to allow a caesarean section to be performed within 30 minutes from decision to operate to delivery of the baby.
- 2.4. High quality ultrasound equipment should be available on the labour ward at all times. This should allow the performance of invasive procedures such as amniocentesis. The equipment should be maintained to the minimum standards required by the Royal College of Radiologists and the Royal College of Obstetricians and Gynaecologists. There should be a training programme for the relevant staff.
- 2.5. There must be adequate numbers of electronic fetal monitors (at least one for every 500 deliveries per annum⁵ with one or two spare as 'back-up'). The monitors should allow the effective surveillance of multiple pregnancies.
- 2.6. There must be a sufficient number of appropriate devices for accurate control of intravenous infusions (at least one per delivery room).
- 2.7. There must be a blood gas analyser capable of measuring pH, pO₂, pCO₂, and base deficit¹¹.
- 2.8. There should be facilities for Gram staining and microscopic examination of specimens such as urine and liquor, and 24 hour availability of microbiological culture.
- 2.9. There must be 24-hour availability of appropriate haematological, biochemical and microbiological services. A particular priority is the provision of facilities for immediate crossmatching and rapid provision of blood and blood products. Two units of O negative blood should be available within five minutes and fully crossmatched blood should be available within 30 minutes of the laboratory receiving the sample.

- 2.10. There should be ready availability of fetal assessment (growth and biophysical profile assessment) and invasive diagnostic services such as amniocentesis and cordocentesis.
- 2.11. Specialised services for perinatal pathology should be readily available on a daily basis.
- 2.12. There must be an appropriate information infrastructure to provide routine statistics for medical audit, hospital reports, and contracting requirements.
- 2.13. There must be enough delivery rooms to ensure that there will be immediate access for any woman in labour.
- 2.14. There must be enough infant resuscitators to ensure their availability at all births (for details of numbers per birth and recommended specifications for the machine, see *Neonatal Standards for the provision of Perinatal Care*).
- 2.15. There should be ready availability of maternal imaging, including X-ray.
- 2.16. There should be facilities that are appropriate for women having labour induced for fetal demise or termination of pregnancy for fetal abnormality.

3. **Organisation**

- 3.1 A labour ward handbook should contain clear guidelines for the management of hypertensive disease, diabetes, haemorrhage, threatened and actual preterm labour, prelabour rupture of the membranes, and measures to promote fetal lung maturity (this list is not exhaustive).
- 3.4 Clear arrangements for in-utero transfers should be in place. These should include the availability of senior staff to assess suitability of transfer in women who are bleeding or hypertensive, or in whom delivery is imminent.
- 3.4 The midwifery management structure should allow for midwifery involvement in the planning of high risk services.
- 3.4 Regular review meetings and clinical ward rounds should take place jointly between midwifery, obstetric, paediatric and anaesthetic staff. In particular there should be:
 - 3.4.1 Monthly perinatal audit
 - 3.4.2 Regular maternal morbidity audit
 - 3.4.3 Regular 'near miss' (critical incident) audit
 - 3.4.4 Regular perinatal pathology review
- 3.5 An active perinatal research programme is desirable.
- 3.6 An epidural service must be available 24 hours per day, and the maximum delay from requesting an epidural for elective pain relief should be one hour. Women should be visited by an appropriately qualified anaesthetist before and after every epidural procedure; regular post delivery audit must be performed.
- 3.7 There should be appropriate arrangements for the regular review of safety in relation to patients, visitors and staff (including security).
- 3.8 Appropriate records of clinical activity should be kept; for example, high dependency charts suitable for obstetric cases should be available. Maternity records of previous pregnancies should be available throughout the index pregnancy.
- 3.9 There should be a resuscitation team available within five minutes, both for adults and neonates. There should be a well rehearsed major obstetric haemorrhage protocol.
- 3.10 Services for genetic counselling should be available on site.
- 3.11 Facilities for neonatal surgery should be easily accessible.
- 3.12 Psychological support services and bereavement counselling should be provided; a psychiatric opinion should be available within 24 hours.
- 3.13 Special arrangements for support after termination for fetal abnormality should be in place.
- 3.14 There must be regular training in maternal and neonatal resuscitation for all staff (medical and midwifery)

LEVEL 2 - DISTRICT GENERAL HOSPITAL (with short term intensive care capability)

4. Staffing

- 4.1 There should be a designated consultant obstetrician available at all times; during the day they should be within the hospital although they may have other duties such as clinics (preferably not operating sessions). There should also be some designated consultant labour ward sessions. The purpose of these should be teaching and organisation, not to replace the presence of junior staff.
- 4.2 A designated registrar or equivalent should preferably be available for labour ward duty at all times without other commitments, although they may have clinic duties elsewhere in the hospital (but not operating).
- 4.3 A senior House Officer should be present on labour ward at all times (allowing for meal breaks). Residency accommodation should be adjacent to the labour ward.
- 4.4 There should be an anaesthetist available at all times for labour ward duty without other commitment; if the anaesthetist is not a consultant a nominated consultant anaesthetist should be available at all times.
- 4.5 Resident paediatric cover should be available at all times, with nominated consultant supervision.

5. Facilities

- 5.1 The labour ward should have ready access to an operating theatre at all times.
- 5.2 There should be facilities for high dependency (and preferably, intensive) care within the hospital.
- 5.3 There should be easy access to the antenatal ward, postnatal ward, antenatal clinic, ultrasound services and special care baby unit.
- 5.4 There should be provision of adequate numbers of electronic fetal monitors.
- 5.5 Facilities should be available for pH estimation on fetal blood samples, day and night, within fifteen minutes.
- 5.6 There must be dedicated telephone lines.
- 5.7 Provision should be made for reception of women in labour, and maintenance of adequate security, throughout the twenty four hours.
- 5.8 There should be easy access for women in labour, and ambulances.
- 5.9 Facilities for, and the results of, appropriate pathology tests must be readily available.

6. Organisation

- 6.1 There must be regular audit meetings. These should include perinatal mortality and morbidity and joint meetings with the paediatricians.

- 6.2 There must be a clear chain of responsibility from SHO to registrar to consultant; this should also define the working relationships of midwives and medical staff.
- 6.3 There should be agreed policies for the management of G.P. maternity cases, DOMINO cases, midwife-managed cases, independent midwife cases, ambulance and paramedical staff involvement, and home births. There should also be agreed policies with the community services and the regional/local level three obstetric unit in relation to in-utero transfers.
- 6.4 There should be regular induction and update courses in relation to neonatal resuscitation.
- 6.5 All new staff (medical and midwifery) should attend a formal induction course.
- 6.6 The unit should be able to demonstrate that formal in-service training in resuscitation and the management of sick infants exists for all staff, including SHOs. There should be written guidelines for resuscitation and intensive care procedures.
- 6.7 The unit must keep activity and mortality statistics.

LEVEL 1 - G.P. OR MIDWIFERY UNIT WITHIN OR ADJACENT TO A CONSULTANT OBSTETRIC UNIT

7. Staffing

7.1 Such a unit is essentially midwifery led, but with the safeguard of recourse to medical assistance (obstetrician, G.P., anaesthetist or paediatrician) should unexpected complications arise. It is particularly suitable for women without obvious risk factors who wish to have a labour with minimum technological intervention.

8. Facilities

8.1 There is no requirement for anything other than minor operations facilities (e.g. episiotomy repair).

8.2 There need only be facilities for temporary high dependency care (i.e. prior to emergency transfer).

8.3 There should be easy access for family visiting.

8.4 There should be at least one electronic fetal monitor, for use in unexpected emergencies (e.g. suspected placental abruption). The staff should also be trained to use it and interpret the recordings it makes.

8.5 There must be dedicated telephone lines.

8.6 Provision should be made for reception of women in labour, and maintenance of adequate security, throughout the twenty four hours.

8.7 There should be easy access for women in labour, and ambulances.

9. Organisation

9.1 The most important requirement is ready co-operation and communication between the midwife supervising the birth and relevant medical staff, i.e. the obstetrician or G.P. Clear local guidelines should be in place regarding the circumstances in which referral to medical staff should take place, and the procedures for effecting this.

9.2 Information should be given to all women booking at such a unit regarding the facilities (and their limitations), and the procedures for transfer should serious complications occur.

DELIVERIES AWAY FROM CONSULTANT OBSTETRIC UNITS

Although some women and their babies are at a very low risk of complications, their risk is never zero. In order to make an informed choice of their place of delivery, women must be advised of the known risks of the various options. This advice must be given in a non-confrontational, non-judgmental style.

10. G.P. AND MIDWIFERY UNITS.

There should be provision for:

- 10.1 Resuscitation including intravenous infusion with plasma expanders (or blood, if available).
- 10.2 Outlet forceps/ventouse delivery.
- 10.3 Repair of the perineum.
- 10.4 There will be no facilities for specialised procedures such as caesarean section or epidural anaesthesia. Neonatal resuscitation is likely to be only by pharyngeal suction and bag and mask ventilation. However, there should be arrangements to keep the baby warm, and naloxone must be available if opiates are used for maternal pain relief.
- 10.5 There should be established mechanisms for seeking specialist advice and assistance in an emergency.

11. HOME BIRTHS

- 11.1 If women choose to deliver in this setting, there will inevitably be a time delay between the occurrence of a complication and the completion of transfer into a consultant obstetric unit. This time factor may prevent a fully effective response to acute complications such as fetal hypoxia during labour or primary postpartum haemorrhage. It may also be more difficult to carry out procedures such as repair of a second or third degree tear, because of inadequate lighting and positioning of the mother. It should be documented that women are clearly aware of these limitations before labour begins, for medico-legal reasons and to ensure that choice is fully informed.
- 11.2 There should be at least two professionals present at the birth, one of whom should be proficient at basic neonatal resuscitation.
- 11.3 Efficient mechanisms for the transfer of mother and baby to a consultant unit should be in place and be reviewed at regular intervals. These should be the primary responsibility of the ambulance service and transfer is best conducted under the aegis of appropriately trained paramedical staff.
- 11.4 The risk of intrapartum death in appropriately selected low risk women should be no higher than one per thousand. Constant review should be undertaken to ensure that all stillbirths are fully investigated for preventable factors.
- 11.5 The requirement for neonatal resuscitation should be no higher than one per hundred births. This is not sufficient to maintain resuscitation skills and therefore regular retraining with videos and mannequins should be undertaken.
- 11.6 Regular audit should include:
 - 11.6.1 Consumer satisfaction surveys
 - 11.6.2 Monitoring of rates of transfer to consultant unit care

- (a) during pregnancy
- (b) during labor
- (c) during the immediate puerperium

11.9.3. Monitoring of maternal morbidity e.g.:

- (a) second, third or fourth degree perineal trauma
- (b) retained placenta
- (c) postpartum haemorrhage
- (d) puerperal pyrexia

11.9.4 Rates of transfer of the baby following delivery to specialist neonatal care

11.9.5 Monitoring of neonatal morbidity e.g.:

- (a) low Apgar scores
- (b) need for resuscitation
- (c) need for admission to specialist neonatal unit

Reference List

1. Chamberlain G and Patel N. (1994) *The Future of the Maternity Services*. London: RCOG Press, pages 1-310
2. Hibbard, B. M., Anderson, M., Drife, J. O., Tighe, J. R., Gordon, G., Willatts, S., de Swiet, M., Shaw, R., Thompson, W., Lewis, G., and Botting, B. Report on Confidential Enquiries into Maternal Deaths in the United Kingdom 1991-1993. ISBN 0-11-321983-0, 1-205. 1996. London, Her Majesty's Stationery Office.
3. Confidential Enquiry into Stillbirths and Deaths in Infancy, 4th Annual Report. Shaw, R. W. 1-74. 1997. London, Maternal and Child Health Research Consortium, 188 Baker Street, NW1 5SD.
4. Bradshaw C, Lewis P, Steer PJ. A midwifery team for high-risk pregnancies. *Modern Midwife* 1995;5:26-29.
5. RCOG. Guidance on Labour Ward Practice. 1994. London, Chameleon Press Ltd, 5-25 Burr Road, SW18 4SG.
6. Clarke, T., Couchman, J., Hayes, J., Hinchcliffe, D., Mahon, A., Price, D., Rowe, A., Sims, R., Smyth, M., Winterton, N., Wise, A., and Durant, A. Health Committee Second Report - Maternity Services - Volume I. Winterton, N. ISBN 0-10-283092-4, 1-cxxix. 1992. London, Her Majesty's Stationery Office.
7. Lilford, R. J., Allison, J., Cavenagh, A. J. M., Chapple, J., Friend, J. R., Goodman, M., Kirkham, M., Kirkup, W., Maresh, M. J. A., Settatee, R. S., Warwick, C., and Dhillon, C. Organisational Standards for Maternity Services. 1-55. 1995. London, The Royal College of Obstetricians and Gynaecologists.
8. Munro, A., Alment, A., Atlay, R. D., Beak, J., Billing, A. M., Brain, M. A., Gamsu, H. R., Greenwood, J., Herbert, B. D., Hibbard, B. M., Judson, A. M., Leeson, J., Limerick, C., McKendrick, M., Monks, A., Mowat, S., Price, L., Senior, O. E., Taylor, G. W., and Webb, J. K. G. Maternity Care in Action. Part 1 - Antenatal Care. ISBN 0-902650-86-6, 1-24. 1982. London, McCorquodale Printers Ltd for Her Majesty's Stationery Office. First Report of the Maternity Services Advisory Committee.
9. Munro, A., *et al* Maternity Care in Action. Part II - Care During Childbirth (Intrapartum Care). ISBN 0-946539-22-7, 1-31. 1984. London, McCorquodale Printers Ltd for Her Majesty's Stationery Office. Second Report of the Maternity Services Advisory Committee to the Secretaries of State for Social Services and for Wales.
10. Munro, A., *et al* Maternity Care in Action. Part III - Care of the Mother and Baby (postnatal and Neonatal Care). ISBN 0-946539-79-0, 1-24. 1985. London, McCorquodale Printers Ltd for Her Majesty's Stationery Office. Third Report of the Maternity Services Advisory Committee to the Secretaries of State for Social Services and for Wales.
11. Whittle, M., Cavenagh, A. J. M., Halliday, H. L., Jardine Brown, C. P., McGinley, M. C., Rubin, A., Walkinshaw, S., and Gawith, A. Minimum Standards of Care in Labour. ISBN 0-902331-73-6, 1-28. 1994. London, RCOG.