10 April 2003

Dear Colleague

Report of DH expert working group on Neonatal Intensive Care Services

I enclose the conclusion report of the expert working group on neonatal intensive care. The group was convened by the Department of Health in order to provide advice on the most effective ways of caring for very sick or very premature newborn babies. The expert working group has considered the views both of professionals delivering neonatal care services and those of parents whose babies have received care from the service. Background papers to the review are available on www.doh.gov.uk/nsf/neonatal.htm.

The care of these very small or sick babies is extremely challenging, not least because the effects of care in these earliest days can be marked and long-lasting. For these babies, the Group has recommended that some concentration of expertise offers opportunities for the most effective delivery of services.

The Government wishes to see the majority of care for pregnant and newly-delivered mothers and their babies delivered as close to their homes as possible, and, where possible, in a setting of their and their partner's choice. And for the vast majority of mothers and newborn babies, there is no reason why that should not continue. Indeed, these recommendations also give opportunities for improving local care provision.

The Report suggests a more structured, collaborative approach to caring for newborn babies. It proposes that hospitals work closely together in formal, managed networks, to provide the safest and most effective service for mothers and babies. This would include the designation of some hospitals that were specially equipped to care for the sickest and smallest babies, with other hospitals providing high dependency care and shorter periods of intensive care as close to home as possible. The numbers of hospitals in each network would be for local decision but must reflect local need and geography.

Currently, some mothers and babies are travelling long distances for their care –often not in a planned way or to the closest possible destination; our aim is to ensure that when transferring a mother or baby it is done in a planned, informed way and for the best clinical reasons.

As the numbers of babies requiring this sort of care are small, we would not expect that any proposed changes to the neonatal care services would have an impact on local maternity service provision. One of the aims of the proposals is to provide for local services for all babies, except those who need the most intensive care in designated units.

The Review also contains proposals regarding staffing skills, information and support to parents. I am circulating the report to seek your views on its recommendations as I wish to take account of as wide a range of opinion as possible in forming policy.

I should particularly like to receive comments on three areas of the Review Group's report:

- the Group's suggestions for the formation of managed clinical networks to deliver neonatal intensive care (para 22);

- the catagories of care and the designation of units that would provide the various levels of care (para 29); and

- issues around staffing including recruitment and retention (para 34). It would be particularly helpful for us to receive examples from the field of good practice in these areas.

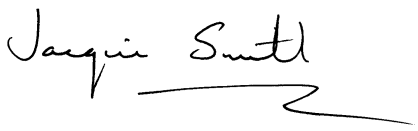
Comments on these and all other aspects of the Review Group's report would be extremely welcome. They should be sent to nicconsultation@doh.gsi.gov.uk or to the Neonatal Intensive Care Review, 509 Wellington House, 133-155 Waterloo Road, London SE1 8UG by 11 July 2003.

In 2000 we announced an extra £5million for neonatal services. This money, in conjunction with the increase in spending to the NHS this year, has been available to increase capacity where more cots are needed and to further improve the quality of the service.

To help NIC services to implement the recommendations of this review we are making available £20m for capital expenditure and an additional £12m for running costs in 2003-04. The additional money for running costs will increase to £19,857,000 in 2004-05 and to £20 millions in 2005-06

Thank you for helping us.

Yours sincerely.



JACQUI SMITH MP
MINISTER OF STATE

Report of the Neonatal Intensive Care Services Review Group

April 2003

NEONATAL INTENSIVE CARE REVIEW- *Strategy for Improvement*

SUMMARY

THE REVIEW

1. In order to determine the best way of organising neonatal care in the future, a review of the existing services in England has been carried out. It has considered the current challenges facing the system and concluded that the current delivery of neonatal care is not sustainable and that change is required. The review recommends best practice for the service. (A description of the review process and supporting evidence is attached)

2. The resulting *Strategy for Improvement* suggests standards for the different levels of care that babies might need, recommends where that care might best be delivered, how services can be developed and the sort of support and information that parents are likely to need.

3. The *Strategy for Improvement* aims to provide local services. The recommendations for best practice will enable local units to remain open and meet the new Working Time Directive by concentrating most intensive care in fewer units.

4. Trusts might wish to measure their achievement of the Review's recommendations by considering the following criteria:

    - Establishing networks of care that would provide access for all families to appropriate and high quality care

    - Defining clearly the type of care that babies might require - special care, high dependency and intensive care

    - The designation of units to provide these levels of care e.g. some units would only provide special care, most would provide high dependency and limited intensive care and some, the full range of intensive care.

    - Establishing staffing levels with new ways of working

    - Recommending increase in cot capacity in the units providing intensive care and strengthening the role of SCBU to provide high quality special care for babies.

5. Key elements in developing a high quality neonatal intensive care service would include:

    - having designated clinical networks;

    - stopping inappropriate transfers of babies out for intensive care; ensuring that babies with complex care needs or requiring long periods of respiratory support are cared for initially in a level 3 unit (especially for babies born at 27 weeks gestation or less); and

- in the longer term working towards a greater consultant presence in level 3 units.

6. Evidence shows that immaturity related conditions contribute significantly to inequality in infant mortality rates between the manual groups and the rest of the population. The recommendations made in this review for the neo-natal service might impact the national target to reduce the gap by at least 10 %.

7. There is a trend of increasing numbers of low birth weight babies in recent years. Evidence indicates that 200-300 lives might be saved by restructuring neo-natal intensive care services.

BACKGROUND

8. Neonatal services aim to offer high quality care for some of the most vulnerable babies in our society. Approximately 10 per cent of babies require some form of specialist support at birth with 1-3 per cent of these requiring Neonatal intensive Care (NIC).

9. Most DGHs currently offer some level of neonatal care ranging from special care to intensive care. Hospitals differ in the numbers of babies cared for and the frequency with which they are treating babies with intensive care needs.

- ***Special care*** is providing (a) the care of less immature premature babies who no longer need high dependency or intensive care whilst they grow to a stage of maturity ready for discharge. This includes tube feeding, maintenance of body temperature and monitoring; and, (b) the care of babies recovering from illnesses or operations e.g. treatment of infections, jaundice and special nutrition.

- ***High dependency care*** is providing higher levels of clinical care including those recovering from intensive care. This includes babies receiving oxygen for immature lungs as they breathe on their own, sometimes assisted by higher pressure given via nasal prongs; babies on intravenous nutrition or treated with chest drains or for convulsions, infections or metabolic problems.

- ***Short term intensive care*** is provided for less immature babies who need mechanical assistance from a ventilator to breathe and for some this may only be for 1 to 2 days as the effect of artificial substances (surfactant) given through the breathing tube located in their lungs takes effect and they can move to high dependency care.

10. **Neonatal intensive care** is needed for

- babies born prematurely, simply to support organ systems until they have matured; and

- babies who are ill or who have congenital disorders.

11. The greater the immaturity, the more needs to be done to support a baby's breathing (often with mechanical ventilation), and to protect from infection and to achieve growth equivalent to that which occurs in the womb. Thus even "well" very premature babies require intensive care simply to support their life

until their organ systems undergo maturity. This includes sophisticated mechanical ventilation with oxygen, intravenous feeding, and the use of incubators to control body temperature and protect from infection. It also involves treatment of illnesses which are more common in such vulnerable babies.

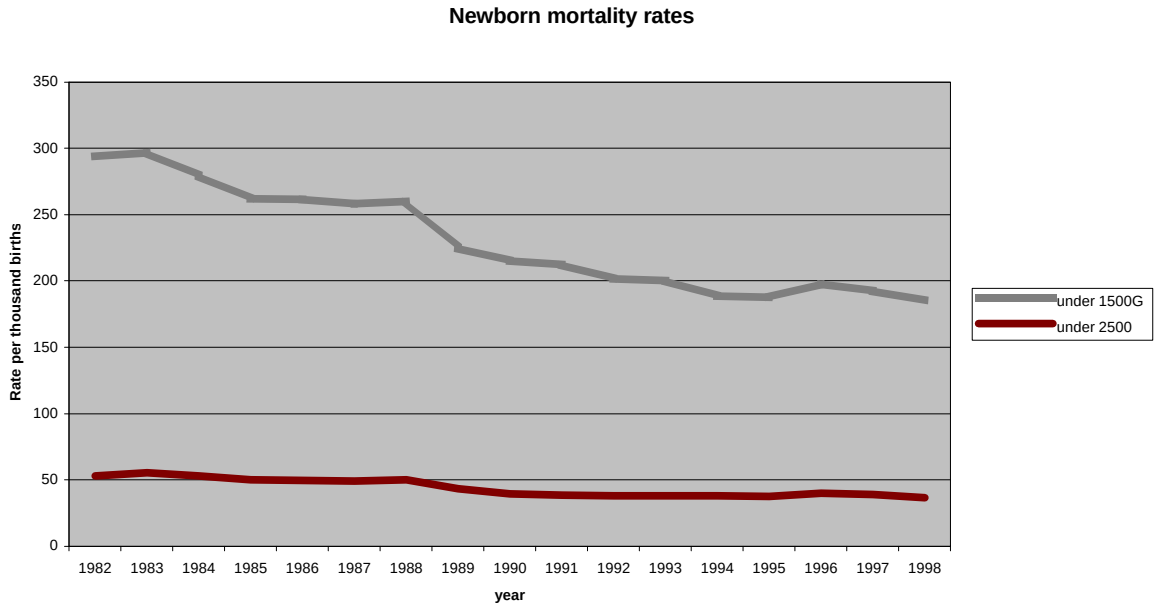
12. Intensive care, frequently needed for a period of weeks, is then followed by further weeks of high dependency or special care provided in neonatal units as the babies grow to maturity.

13. NIC is also required for a small number of larger, more mature, babies who become ill from complications of delivery, from infection or metabolic disorders or when surgical or other treatment is required for congenital anomalies such as congenital heart disease, disorders of the lung or gut, or of other organs.

Recent Trends

14. Increasing capability of technology and development of health care expertise has led to greater numbers of very small babies being born alive and surviving. In the past many such babies died before or just after birth. Once born babies require quite prolonged periods of supportive care over several weeks.

15. In 1975 of babies born prematurely with birth weight 1500 g or less, about half died in the newborn period (and many others were stillborn). By 1985 this had halved to 1 in 4 and in 1995 had fallen further to 1 in 6 (other babies who previously would have been stillborn are now being born alive).



Reasons for the Review

16. A national review of neonatal care within England was undertaken in 2001 with the aim of establishing the current level of provision in England, the

particular challenges the service is facing and the ability of the service to expand and develop in order to meet the apparent increasing demand arising from the greater complexity and amount of care required by babies. It was conducted through a process of collaboration with regional neonatal care leads and establishment of an external reference group including representatives of parents and commissioners and providers of care.

17. The Department of Health provided £10.5m for critical care nurse training courses, including neonatal intensive care, in 2000/01, plus a £6.5m for new and upgrade neonatal intensive care equipment. Another £5m, year on year funding, was also provided to address particular local challenges in neonatal care, and over 2001/02 and 2002/03, £100m is being made available to improve maternity suites.

THE STRATEGY FOR IMPROVEMENT

18. A widely representative external reference group for the Review (the membership is listed in Annex A) considered information, evidence and opinion from a variety of sources. Its conclusions and recommendations are based upon research evidence as far as possible and when this was not available, on agreed professional consensus. The review and resultant strategy were informed by the standards published by the British Association of Perinatal Medicine [BAPM] *Standards for Hospitals Providing Neonatal Intensive and High Dependency Care and categories of babies requiring neonatal care*. 2nd ed 2001.

REVIEW FINDINGS

19. The Review found that:

- The current pattern of transfers could be improved for parents, babies and staff
- Neonatal intensive care is currently provided in a widely dispersed manner and there is a need for agreed national standards of care
- Staffing issues are key to sustainability of neonatal services and the existing skills and experience should be harnessed. Yet major challenges are posed by the need for nursing recruitment to keep up with increased demand, and also by medical staffing pressure
- There is a lack of national data regarding outcomes for intensive care
- There is limited capacity in larger units which provide care for the most ill babies
- The provision of transport teams by the larger units at times depletes the host unit to unacceptable levels of the staff needed to provide care in that unit
- The review *concluded* that change was required in the current service arrangements.

Options considered

20. The review considered 2 options-

- major centralisation of intensive care;
- moves to provide care within managed clinical networks.

21. **Major centralisation was rejected** because, in contrast to the paediatric intensive care service in which periods of care usually are short, neonatal intensive care is often needed for some weeks. Major centralisation would impose considerable travel and other burdens on families. Also capacity and staffing factors argued against major centralisation. It is important that babies are cared for as close to home as possible and that only the sickest babies would require care in the more specialist centres.

RECOMMENDATIONS FOR IMPROVEMENT

Managed clinical networks

22. The Strategy recommended that all neonatal care should be provided within agreed managed clinical networks comprising hospitals with differing types of neonatal units working together. The purpose of each network would be to ensure, with only a limited number of exceptions, that mothers and babies receive their care within it or very occasionally, within an adjacent network. Mothers should thus be able to receive their care as near to home as possible and to know in advance should a problem arise with their baby where and how care will be provided.

Levels of care provided

23. Within these networks there would need to be (i) agreed identification of the needs of individual babies (**categories of care**) and (ii) agreed designation of the type of units providing for their care (**types of neonatal unit)**.

24. **Networks** would enable the concentration of skills and expertise required for care of babies receiving longer and more complex care. They would offer families the greatest opportunities for local birth and also minimise transfers for intensive care to those which are necessary. For babies transferred for longer term intensive care, networks would facilitate early return to a local hospital when they are recovering. In this way the overall capacity of the system would be maximised and skills, expertise and paediatric training in intensive care are maintained in all neonatal units.

Structure of networks

25. Each network would need to have a supervisory structure involving key stakeholders in the provision of care including representatives of parents, providers and commissioners. Within a managed clinical network, one consultant or other clinician would need to accept a co-ordinating and advisory role for the network on a rotational basis.

Standards

26. A network should have agreed protocols, standards and pathways of care and a joint approach to clinical governance including clinical audit, incident reporting and clinical training.

27. **Alignment with obstetrics and maternity services -** Networks should be determined in alignment with the provision of maternity and obstetric care.

28. **Number of networks -** Regional review groups would need to agree the *number of networks* to be set up taking account of this report and using a modelling toolkit developed by the Department of Health.

29. **Categories of Care -** Four categories of care should be adopted as defined in the BAPM Standards report, that is normal care, special care, high dependency and intensive care.

30. **Types of neonatal unit -** Constituent units within a network should be designated by the activity they are resourced for into three types of neonatal unit as shown in Table 1. Each network would have one or more level 3 units located both in acute general hospitals and in regional centres (one of which acting as a network lead centre) and also a number of level 2 and level 1 units.

Table 1 Types of units providing care for new-born babies

Type of unit	Routine care	Special care	High dependency	Intensive care	
Midwifery (no neonatal unit)	✔				
Level 1: Special care unit	✔	✔			
Level 2 Neonatal unit	✔	✔	✔	(✔ **)	** as agreed within the network
Level 3 Neonatal unit	✔	✔	✔	✔	

Note: This definition of a level 2 unit envisages it providing only short term intensive care. It is however important to recognise that in using the proposed clinical categories a large proportion of high dependency work will be provision of nasal continuous positive airway pressure (CPAP), which under former standards was included with intensive care activity.

Care in a level 2 unit and transfer policies for intensive care

31. The nature of activity to be carried out in a level 2 unit should be agreed locally within each managed clinical network. Generally this will entail the transfer of a mother to a level 3 unit before birth when delivery is expected of a baby before 28 weeks gestation or when a birth weight of under 1000g is likely. When a baby is born in a level 2 unit but goes on to require neonatal intensive care, discussion with the network lead neonatal centre and with parents should take place to agree the appropriate further management of each baby. This practice should avoid unnecessary transfers, for example of a baby ventilated from birth but responding to surfactant therapy in whom extubation is predicted within a few hours, or in a baby whose condition is rapidly improving.

Capacity building

32. Capacity should be built within all units in the networks in order to offer the highest quality of care, to minimise the need for transfers and to enable early return from a level 3 unit to a more local unit. This process will also include building obstetric capacity, which takes into account the potential for critical care in some mothers.

Implementation

33. Implementation of these recommendations would need to be staged as the Strategy recognises that there would have to be sufficient capacity and skills in all types of units in order to make progress.

Staffing issues

Nursing

34. Staffing of units with enough nurses with the right competencies is regarded as fundamental to improvement in the service. Increases would be needed to improve outcomes, support career development and promote recruitment and retention. Annex B gives further details of the Review's recommendations.

Medical Staffing

35. Recommendations on medical staffing are given in detail in Annex B. A level 3 neonatal unit is supported by a clinical team with no responsibilities other than in neonatal care in contrast to a level 2 neonatal unit in which the clinical team also has concurrent commitments to provision of general acute paediatric services. Achievement of the standards set out will be an evolutionary process requiring flexible interim arrangements.

Flexible workforce arrangements.

36. Nurse consultants and nurses with advanced practice qualifications could work within the system strengthening the staffing structures to support neonatal intensive care.

Facilities and equipment

37. Facilities and equipment should reach the standards set in the BAPM report.

Transport systems

38. Transport arrangements would need to be in place both for the movement of critically ill babies and also for babies being taken back to a unit near their homes. Geography and population size will be relevant factors in determining the ideal transport system for the networks. Transfer protocols for managed networks should take account of patient flows and accessibility of networks.

39. Staffing arrangements for the neonatal transport service should be separate from the clinical inpatient service so that care of babies is not compromised by lack of staff availability. A variety of models of centrally provided new-born transfer exist, including clinical support by doctors, advanced practice nurses and paramedics.

INTER RELATIONSHIPS

Neonatal surgery

40. New-born babies who have surgical conditions should receive the same level of neonatal support as sick infants with medical conditions and where possible medical and surgical neonatal services should co-exist.

Obstetrics and Maternity

41. Changes proposed for neonatal services would influence arrangements for obstetric and foetal-maternal medicine services, which need to function in parallel with a neonatal network especially for high risk pregnancies. The

recommendations in this report should not affect the current numbers of maternity units.

Children's services

42. Neonatal services are dependent upon inpatient and community-based paediatric and child health services for medical staffing and many of the support services required by a neonatal intensive care unit (detailed in the BAPM Standards document). To provide properly supported stand-alone neonatal services, without an adjacent paediatric unit is neither cost-effective nor practicable in other than the very largest centres. Level 2 neonatal units can only operate as part of a general paediatric unit, alongside an obstetric unit, because paediatric staffing is shared with the general paediatric service although sufficient staffing must be in place to meet the level of intensive care activity being provided.

Other specialised services

43. In perinatal centres, paediatric sub-specialists (cardiology, haematology, endocrinology, gastro-enterology, hepato-biliary, radiology, nephrology, neurology) provide important paediatric specialist input when indicated. These and surgical specialities (otolaryngology, neurosurgery, ophthalmology, cleft lip and palate services) are critical to providing the range of support for the pregnant woman and her new-born baby as appropriate. All these services do not need to be provided on the same site. Arrangements would need to be made with a perinatal centre associated with, but not necessarily on the same site as, a level 3 unit for support from these services.

FACILITIES AND STANDARDS FOR PROVISION FOR PARENTS

44. High priority should be given to the needs of the family whose baby is receiving neonatal care, especially when the baby is moved for ongoing intensive care. This would include providing accommodation for families while their baby is in intensive care, including family rooms (for couples and siblings), bathrooms, basic self-catering facilities and a play area for siblings of infants receiving care.

BEST PRACTICE FOR RESEARCH AND DEVELOPMENT, DATA, INFORMATION AND AUDIT

45. Across constituent hospitals in a network attention would need to be given to education, evidence–based practice, clinical audit and agreed guidelines for care. We see networks also facilitating continuing professional development for all their staff.

46. Networks should also facilitate research into aspects of care, especially into outcomes other than mortality, which should be linked to nature of care.

AUDIT

47. The review recommends that national professional groups should develop internal and external benchmarking processes to evaluate performance including co-ordinated follow up arrangements.

48. Furthermore, the review recommends that NIC networks should develop IT infrastructures to support audit of activity and outcomes. Agreed datasets should be considered for neonatal intensive care and linked to defined measures of outcomes to allow for the development of an overall audit system in time. The numbers of babies requiring intensive care and transfers should be monitored by networks in order to provide comparative data. Networks should consider joining evolving benchmarking processes and to publish activity and outcomes annually.

TAKING FORWARD RECOMMENDATIONS FOR BEST PRACTICE

49. The Review acknowledges that any implementation of the standards in this document would need to take place in a staged way, because of the implications they have for recruitment, retention, professional development and training of the workforce required.

50. Changes in provision would have to be decided on and implemented locally following local reviews. These could be initially co-ordinated under regional specialist commissioning arrangements.

51. Following establishment of managed clinical networks, which would involve a negotiated engagement of the units concerned, the Review recommends that improvements in neonatal intensive care services would be best addressed by:

- identifying and enhancing the capacity of the level 3 units. This would enable intensive care to be offered as part of a planned care package for mothers and avoid the need for inappropriate transfers out of a managed clinical network.

- directing resources to staffing of all levels of unit throughout the network matching their workload. Account would need to be taken of geographical factors to minimise or avoid undue travelling distances.

52. Within these main areas we recommend that first consideration be given to:

- designating the units within each network. The number of service networks would need to be agreed as part of this process as would the number of sites which house level 3 units meeting the standards given in this report.

- increasing the capacity of level 3 units, which would require effective nursing and medical training, recruitment and retention strategies working with workforce federations. It would also involve attention to physical capacity and space.

ANNEX A

MEMBERSHIP OF THE EXTERNAL ADVISORY GROUP

Dee Beresford, Executive Officer, Neonatal Nurses Association

Dr Rollo Clifford, Clinical Lead for Paediatrics and Child Health, Dorset County Hospital

Professor Kate Costeloe, Professor of Paediatrics, Department of Child Health, Bart's and The London School of Medicine and Dentistry, Homerton Hospital, London

Suzanne Dobson, ex-Chief Executive, BLISS - The National Charity For The Newborn

Noel Durkin, Child Health Policy Team, Department of Health

Janet Faulkner, Neonatal Pathway Leader, School of Nursing Midwifery and Health Visiting, Manchester University, Royal College of Midwives

Professor David Field, Professor of Neonatal Medicine, University of Leicester

Bonnie Green, Head of Professional and Public Affairs, BLISS - The National Charity For The Newborn

Juliette Greenwood, Great Ormond Street Hospital for Children

Dr Margaret Guy, Consultant in Public Health Medicine, Department of Health London Regional Office

Dr Patricia Hamilton, Consultant Neonatalogist and Honorary Secretary of the Royal College of Paediatrics and Child Health

Dr David Hughes, Economic Adviser, Department of Health

Professor David James, Department of Fetal Medicine, University Hospital of Nottingham

Dr Roderick MacFaul, Paediatric Adviser, Department of Health (Chair)

Katrina McNamara, Children's Nurse Adviser, Department of Health

Professor Neil Marlow, Academic Division of Child Health, Queen's Medical Centre University Hospital, Nottingham

Wendy Morrison, Deputy Regional Nurse Director, Department of Health Northern and Yorkshire Region

Dr Richard Miles, Consultant Paediatrician, Hinchingbrooke Hospital

Dr Janet Rennie, Consultant and Senior Lecturer in Neonatal Medicine

Philip Sands, Executive Director, Calderdale and Kirklees Health Authority

Jane Scott, Team Leader - Child Health Policy, Department of Health

Dotty Watkins, Head of Midwifery and Gynaecology Nursing, East Kent Hospitals NHS Trust

Dr Michael Webb, Consultant Paediatrician, Gloucestershire Royal Hospital

Professor Andrew Wilkinson, Professor of Paediatrics, Department of Paediatrics, University of Oxford, John Radcliffe Hospital, Oxford

ANNEX B

NURSE STAFFING

The nurse-staffing requirements for an individual baby relate to his/her clinical need rather than to where the care is provided. The nursing establishment for a neonatal unit should be based upon cot occupancy and level of care so that on each shift the following are available for babies receiving each level of care:

	Special Care	**High Dependency Care**	**Intensive Care**
Nurse : infant ratio	1:4	1:2	1:1

There should be an additional shift supervisor, as well as sufficient clinical practice staff to cover annual leave, sickness and study leave.

Staffing on a day-to-day basis should reflect infant and family dependency rather than simply cot numbers. The following formula can be used although this tends to underestimate numbers of nurses required when taking into account the need for continuing personal development or maternity leave.

> Establishment (whole time equivalents) = ([no. of intensive care cots] + [no. of high dependency cots/2] + [no. of special care cots /4] +1)x 5.75

An addition is also needed for specialist nursing responsibilities in e.g. infection control, professional support, management, education and mentoring. Career progression and out reach expert supporting roles within networks add again to the nursing establishment requirements.

MEDICAL STAFFING

Long-term strategy for medical staffing for Level 3 units: Each level 3 unit should work towards a service delivered by consultants supported and assisted by non consultant career grades, trainees and advanced neonatal nursing practitioners throughout 24 hours with a consultant present at all times in the hospital.

Medical staffing for level 2 and 3 units.

Three tier staffing should be available for each service throughout a 24 period, comprising:

Tier	***Level 3 unit***	***Level 2 unit***
Consultant	At all times one consultant neonatologist responsible for continuity and planning of patient care and available for advice to units in the network.	At all times consultant paediatrician, usually also covering general paediatrics. One consultant in the team will assume a lead role for the neonatal unit responsible for management of the unit, setting of policy and responsibilities within the network. Each consultant providing cover for a level 2 unit should demonstrate professional development in and commitment to neonatal care.
Middle grade	Competent resident neonatal medical or nursing staff on a shift system to provide immediately available care to neonatal unit.	Resident competent medical staff, covering both general paediatric and neonatal services.
First tier	SHOs or ANNPs, providing continuous support and supervision of care on the neonatal unit immediately available in the maternity/neonatal unit at all times	SHOs or ANNPs without responsibilities or other commitments elsewhere immediately available for the neonatal service at all times

Larger level 3 units

Each level 3 unit will need to make an assessment of the adequacy of these minimum levels of staffing when covering a busy delivery service or a larger neonatal unit. In a large level 3 unit e.g. one with over 12 intensive cots, a second resident team may be necessary.

Level 2 units engaged in intensive care

When level 2 neonatal units undertake intensive care professional staff with the appropriate competency must be ***immediately available*** for emergencies in the maternity/neonatal unit. This standard is proposed so that wherever a baby is receiving intensive care they are able to benefit from similar standards of care.

In a level 2 unit, where busy general paediatric and neonatal services co-exist, extra resident staff are likely to be required to maintain cover for the neonatal unit. Other considerations to be taken into account include the configuration of the hospital site for instance, excessive distances between general paediatric facilities and the new-born unit will require additional staffing.