BRITISH ASSOCIATION OF PERINATAL MEDICINE

SERVICE STANDARDS FOR HOSPITALS PROVIDING NEONATAL CARE

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'Service Standards for Hospitals Providing Neonatal Care'

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FOREWORD

It is nine years since BAPM last revised its Standards document and in that time the service has changed radically both in terms of its organisation and workforce. Another major change has been the development of recommendations, standards, guidelines and principles relating to different aspects of neonatal care, by various organisations and professional groups. These include: The Neonatal Toolkit[1], RCOG standards on maternity care[2], NICE standards for neonatal care[3], CNST Maternity Standards[4] and the BAPM guidelines on the management of babies born extremely pre-term [5]. This document is not intended to replace any of these publications but rather to complement them and provide additional detail.

One major change in this version of the Standards is the absence of the updated categories of care. The importance of these categories has grown over time and in particular they are closely linked with the National Critical Care Minimum Dataset which for many is the basis of the contracts for their clinical work. As a result their revision is being undertaken by a particularly rigorous and time consuming process and they will be published separately in due course.

Finally these Standards have been developed after extensive consultation with the membership and BAPM is immensely grateful to all those who took the time to contribute.

Prof David Field
BAPM President

1 INTRODUCTION

1.1 Neonatal care has developed over the last fifty years and practice has been strongly founded on both basic science and clinical research. Other practice has developed upon the strengths of clinical experience and observation. The recommendations that follow represent a professional view of the current best practice principles as they apply to neonatal care.

1.2 The British Association of Perinatal Medicine (BAPM), founded in 1976, is the association of professionals who have a special interest in the care of the fetus and newborn baby. Using the evidence available at the time, working groups of the Association in consultation with the membership, the Royal Colleges and the Neonatal Nurses Association prepared the first two editions of this document in 1996 and 2001. Each described the clinical and pastoral needs of sick and vulnerable infants and their families, and set a standard against which the quality of neonatal care could be appraised.

1.3 Since its development in this country in the late 1960s neonatal care has been subject to a number of official reviews and reports highlighting how the service should be both organised and delivered. The most recent has been the report of the Neonatal Task Force (Toolkit for High Quality Neonatal Services)[1] which represents the most comprehensive set of principles yet produced to guide those responsible for providing and delivering the service. More importantly this is the first such document produced by the NHS itself. However the Toolkit relates only to England. One of the key elements of the document is that it enshrines the principle that neonatal care should be delivered through managed clinical networks (an approach first promoted in the 2001 edition of the BAPM Standards). The Association continues to believe that managed clinical networks are the best approach to service delivery for neonatal care. Similar changes in the delivery of neonatal care are taking place in the three devolved nations. These Standards are intended to be applicable throughout the United Kingdom and will be of particular relevance where the neonatal service is delivered through managed clinical networks.

1.4 The Toolkit for High Quality Neonatal Services[1] has provided a common structure and approach against which all neonatal services in England should be provided. We believe that the principles it contains should be considered valid across the whole of the United Kingdom. The aim of this document is to build on that work and provide a professional view of some of the more detailed aspects of service delivery.

1.5 The Toolkit for High Quality Neonatal Services describes networks as being comprised of three types of unit:

Special Care Units (SCU): These provide special care for their own local population. They also provide, by agreement with their neonatal network, some high dependency services.

Local Neonatal Units (LNU): These provide special care and high dependency care and a restricted volume of intensive care (as agreed locally) and would expect to transfer babies who require complex or longer-term intensive care to a Neonatal Intensive Care Unit.

Neonatal Intensive Care Unit (NICU): These are larger intensive care units that provide the whole range of medical (and sometimes surgical) neonatal care for their local population and additional care for babies and their families referred from the neonatal network in which they are based, and also from other networks when necessary to deal with peaks of demand or requests for specialist care not available elsewhere. Many will be sited within perinatal centres that are able to offer similarly complex obstetric care. These units will also require close working arrangements with all of the relevant paediatric sub-specialties.

The exact number of each type of unit and the precise definition of their role will vary between networks but each network will have at least one Neonatal Intensive Care Unit. Access to a specialised transport service is also essential for each network. The transport service should facilitate not only the transfer of babies needing urgent specialist support but also enable the timely return of babies to their "home" unit as soon as clinically possible.

Neonatal Care Service Specification

The following service specification provides a basis for the provision of a neonatal care service based upon current recommendations and evidence.

2 THE PATTERN OF SERVICE

2.1 Each network should estimate their population's needs in terms of neonatal care. This estimate should be reviewed at least every three years. The need for service provision should take into account a variety of local factors such as the size and distribution of the population and the extent of any areas of deprivation. Network boundaries should mirror accepted referral paths and transport links and not pre-existing administrative boundaries.

2.2 The size of individual networks will vary to reflect both the issues mentioned in 2.1 and local geography. Local geography will also influence decisions about which babies should be transferred and which can be cared for locally. Any compromises in the pattern of service made because of local factors should be monitored carefully using established performance measures. The minimum population size will also be affected by the above factors but must be sufficient to make at least one Neonatal Intensive Care Unit economically viable.

2.3 The Toolkit for High Quality Neonatal Services[1] makes clear the anticipated pattern of medical, nursing and allied health professional staff cover in different types of unit. Networks should monitor the extent to which they are able to comply with the principles it contains and, especially during periods when these cannot be met, review performance closely against associated quality performance standards.

2.4 The nursing role, through enhanced skills and advanced practitioner status, is expected to become increasingly integrated with the work of doctors. Networks should ensure that demand for training and development of specialist, enhanced and advanced neonatal nurses is met locally through collaboration with education providers.

2.5 Neonatal Intensive Care Units should have, in addition, highly developed fetal medicine and maternal medicine services in order that women whose babies are likely to require intensive care are managed in centres which can provide appropriate facilities for both mother and baby. These centres should also have facilities for families to be resident, for prolonged periods if necessary.

2.6 Babies requiring surgical care should receive the same level of care, support and specialist expertise as they would receive in a medical neonatal unit. Hospitals that undertake neonatal surgery should have separately identified resources in order to preserve a satisfactory level of cot availability. These cots should be co-located with a Neonatal Intensive Care Unit.

3 CARE OF THE SICK NEWBORN INFANT

All maternity units (of whatever type) must provide facilities for the care of unexpectedly sick newborn infants as described in sections 3.1 and 3.2 below.

3.1 In the Delivery Room

3.1.1 Every maternity unit, whether or not on-going care of sick babies is undertaken, must have clearly established arrangements for the prompt, safe and effective resuscitation of babies and for the care of babies who require continuing support, either in the maternity unit or by safe transfer elsewhere. As a general principle all units should have an established plan to provide stabilisation for sufficient time to allow expert help to arrive. The duration of the stabilisation will vary depending on the anticipated response times locally. The nature of these arrangements (especially when specialised help is not available on site) should be made clear to women when they book for delivery.

3.1.2 When it is anticipated prior to delivery that a baby may require intensive or high dependency care, and this is not available locally, *in-utero* transfer should occur provided this does not jeopardise the mother's health or risk delivery on route. Each network must have clearly established arrangements to facilitate such transfers. These arrangements may include conference call facilities for obstetricians, fetal medicine experts, maternal medicine experts and neonatologists in the network to formulate plans on an individual basis where particular difficulties arise. BAPM has developed a framework for *in-utero* transfers to assist networks in developing such transfer arrangements.[6]

3.1.3 In critical situations where ethical issues may arise, such as a decision whether or not to continue resuscitation for an extremely preterm baby or a baby with a major congenital abnormality, an experienced doctor (usually a consultant) should be immediately available for discussion and in attendance as soon as possible.

3.2 Need for on-going Neonatal Care

3.2.1 Networks in conjunction with commissioners should ensure that all babies needing on-going neonatal care have rapid access to the appropriate level of care as close to home as possible. Key elements in any such plan should include:

- A specialist neonatal transport service
- Established care pathways that allow mothers and babies to access rapidly a unit offering the appropriate level of neonatal care
- Adequate assessment of need and provision of appropriate capacity

3.2.2 Each network should have at least one Neonatal Intensive Care Unit which acts as the "Lead Centre". These units should, on behalf of the network and in collaboration with other units in the network lead on:

- Education
- Training
- Guideline development
- Audit

3.2.3 Each network should have a research strategy which should include developing the role of medical and nursing staff in understanding research governance, and

promoting, supporting and delivering research in accordance with their seniority, training and professional responsibilities.

4 STAFFING

4.1 *Neonatal Nursing Staff - Governance*

4.1.1 Since the publication of the 2001 edition of the BAPM standards, post-registration specialist nurse training has undergone considerable change. Since the demise of the four National Boards for Nursing in 2000 there has been no professional consensus as to the definition of a neonatal nurse 'Qualified in Speciality' (QIS) in terms of agreed education, training and competence. In addition to this, the central validation of courses to support this standard of practice development no longer exists.

4.1.2 Over recent years evidence is emerging that the chances of survival of the smallest and most preterm infants relates not only to nurse staffing ratios but also to the specialist levels of education and experience of nurses delivering care.[7]

4.1.3 The last 5 years have seen the introduction of a national 'Neonatal Nurse Competency Framework' in Scotland (Scottish Neonatal Nurses Group).[8] This framework provides standards which, when integrated with defined education pathways, can be utilised for practice development across the range of neonatal nursing levels. It is recommended that this framework is now integrated across the UK by all neonatal service providers and their partner higher education institutions.

4.1.4 Specialised neonatal nursing requires knowledge and skills not already developed by registered nurses and midwives new to the specialty. Therefore all new nurses and midwives should undertake an induction programme which relates specifically to the fundamental care of the neonate and their family within a neonatal service.

4.1.5 With increasing numbers of nurses working in clinical roles above QIS level, being able to define a qualified neonatal nurse is vital in order to ensure a standard in terms of enhanced or advanced neonatal nurses' roles. In addition to this, a foundation period of learning taking into account both professional and generic competencies is necessary to prepare registered nurses for entry to specialised courses.

4.1.6 It is also anticipated that all nurses involved in direct clinical care will have undertaken a newborn life support course, appropriate to their role, as recommended by the Resuscitation Council UK.

4.2. Definition of Neonatal Nurse Qualified in Speciality (QIS).

4.2.1 Recommendations for achievement of this qualification in speciality, and consequent competency in practice, should include all of the following:

- Registered nurse (adult or children's) or midwife
- Period of preceptorship including defined foundation learning within the speciality
- Completion of a programme of post registration education, which links the following theory and practice elements:

(a) Theory modules relating to the care of the neonate and their family within special care, high dependency care and intensive care, delivered and assessed within a higher education institution.

(b) Achievement of the core skills set, level 2 (SNNG, 2005)[8] undertaken with supervision of an experienced qualified neonatal nurse, assessed in practice and supported by evidence of learning.

(c) Clinical decision making skills.

4.2.2 Core skills set to include:

- Respiratory and cardiovascular management
- Fluid, electrolyte, nutrition and elimination management
- Neurological and pain management
- Skin and hygiene, and infection prevention management
- Temperature management
- Supporting the family
- Investigations and procedures
- Management of health, safety and security for neonates and their families, to include complex medicine management
- Breast feeding support

4.2.3 The identified needs of babies requiring admission to neonatal services are diverse and complex and exist within a range of conditions. Therefore, the specific skills acquisition and assessment in practice must encompass the following range:

- Gestational ages of neonates from extremely preterm to post term
- Birthweight ranges: extremely low birth weight (<1000g), very low birth weight (<1500g), low birth weight (<2500g), normal birth weight, intrauterine growth restriction, large for gestational age
- Physical condition, identification of continuing improvement or deterioration
- Surgical infants with differing conditions
- Infants with congenital abnormalities
- Infants preparing to be discharged home

4.2.4 Recommendation is also made for a national professional body to take responsibility for the regulation and approval of the standard of education, training and competency levels for neonatal nurses QIS. This is likely to strengthen the career pathway for neonatal nursing and may in turn have a positive impact on recruitment and retention of this highly skilled workforce.

4.3 Nurses QIS Working in Roles with Enhanced Practice Skills (ENNP)

4.3.1 Enhanced practice roles exist where QIS nurses have undergone *additional* training and education, based on theory and specific skills acquisition (e.g., intravenous cannulation), to allow them safely to take added responsibilities for practice and clinical decision making.

4.3.2 Networks must agree a defined level of competency with local higher education institutions (HEI), through theoretical and practical assessment of new skills, which fit their individual workforce needs.

4.3.3 The roles of ENNPs within the total network workforce may overlap with elements of the traditional medical role (see 5.1.2 below) as part of a comprehensive multi-professional staffing structure, however nurses working in roles using enhanced skills should have their time acting in these roles defined over and above the nursing workforce of neonatal nurses QIS.

4.4 Advanced Neonatal Nurse Practitioners (ANNP)

4.4.1 The roles of Advanced Neonatal Nurse Practitioners have become more widespread and established since the publication of the 2nd edition of this document in 2001. The education and training of ANNPs exists typically within a Masters framework of education with in-depth knowledge and skills acquisition, preparing neonatal nurses for roles and responsibilities outside those at QIS and enhanced level. These include stabilisation and transfer of sick babies across networks, independent prescribing, initiation of complex procedures, and in some instances caseload management.

4.4.2 Strategies to implement professional validation of advanced nursing practice by the Nursing and Midwifery Council (NMC) are still being explored. However, regulation of neonatal specific advanced practice would not be included within this framework. As with QIS neonatal nurses, we believe that this level of advanced practice should exist under the regulation of the NMC.

4.4.3 Currently ANNPs work within both nursing and medical teams, and do not always have their level of accountability clearly defined. Whilst the consensus for developing QIS neonatal nurses to ANNP's is to follow a 'medical' model of training, some networks do not follow this pathway. Individual hospital trusts should put in place clear tiers of responsibility and accountability, either within nursing or medical structures, or both, to ensure a level of accountability appropriate to the nature of their work.

4.5 ANNP Career Progression

4.5.1 Newly qualified (novice) ANNPs should have a period of consolidation which would allow them to become confident in their expanded roles. At this stage the less experienced ANNP may be working at Tier 1 (see 5.1.2) within the multi-professional team. During this time they would be working alongside and receiving supervision and support from an identified senior medical or nursing member of the team with time set aside for further study to undertake and become proficient in case management and specific skills. These could include, for example:

- complex invasive clinical procedures
- ordering and interpreting x-rays
- attending high risk deliveries and managing resuscitation and initiation of therapies including delivery of surfactant
- presenting on ward rounds and at perinatal review meetings

4.5.2 Training and assessment should be made available if additional areas of practice, e.g., cerebral ultrasound scanning, independent prescribing, are seen to be appropriate within the ANNP roles of individual networks.

4.5.3 A period of review and appraisal should lead to an independent role, taking on a caseload within the neonatal unit. At this level ANNPs would be starting to support and mentor trainee doctors as well as student and newly qualified ANNPs. Role progression may include:

- Teaching/supporting and mentoring junior staff both medical and nursing
- Managing and leading in the transfer of infants between hospitals
- Leading and managing resuscitation at high risk deliveries
- Managing a group of ANNPs in practice

At this stage of proficiency the ANNP would be working within Tier 2 (see 5.1.3) of the multi-professional team.

4.6 Neonatal Nurse Consultant Role

4.6.1 The nurse consultant role may progress from either the specialist, enhanced or advanced roles. It is likely to include involvement in education, training and support of members of the neonatal team across a network, designing and delivering audit and clinical research projects with a specialist expertise in one area of practice.

4.7 Non-Registered Clinical Staff

4.7.1 Non-registered clinical staff (including nursery nurses) support registered and QIS nurses within special care areas. Non-registered clinical staff employed in these roles should be committed to completing the child specific NVQ level 3 training, supported by an assessor experienced in mentoring and support, and provided under the direction of an accredited educational centre. It is recommended that completion of this training occurs within 12 months of their appointment. This group of non-registered clinical staff must have their roles clearly defined within hospitals, and be included appropriately in established numbers.

4.8 Other Nursing Roles:

4.8.1 Senior nurses within the workforce will have added non-clinical responsibilities. Identified nurses, acting as champions for the quality of practice within each unit, should have responsibility in the following areas:

- Breast feeding
- Infant development
- Family support
- Safeguarding children
- Bereavement support and palliative care
- Discharge planning
- Health, safety & risk management
- Education and practice development

4.8.2 In addition to this, day to day management of nursing care provision on neonatal units should be undertaken by a senior nurse who has no clinical commitment during the shift. This role may also include supporting other nurses during periods when additional workload impacts on their bedside caring time. For example, during the acute period of admissions or the internal and external transfer of babies.

4.8.3 Nurses may undertake aspects of care not covered in their initial training, but which do not require education and training to enhanced practice level (e.g., pre and post surgical care, transport, community care). Nurses enhancing their practice in this way should undertake specific education programmes which support this type of extension.

4.9 Staffing Levels

4.9.1 In its review of neonatal units in 2007, Bliss, the special care baby charity, restated the continued deficit in numbers of specialist nurses working in UK neonatal units.[9]

4.9.2 Individual networks should undergo defined workforce planning to determine the established numbers of neonatal nurses at all levels required to support service demands. This should take into account the requirements for nursing time over and above direct clinical care based on a level of increase of 25%, e.g., for education and training, professional development, leave entitlements, sickness, non-clinical commitments.

4.9.3 Recommendations for minimum staffing levels are based on professional consensus. However, recently published studies have explored nursing care time and workload, and related specialist qualification with positive outcomes for babies.[7 10] Reduced numbers of nurses QIS, along with decreased total nursing numbers, can result in care that is not safe or effective in terms of mortality and morbidity.[7]

4.9.4 The following recommendations are based on the numbers of nursing staff that should be available on each shift. Variations in the time available to each baby may occur during, for example, nursing staff breaks or over the acute period of admission of a baby. It is also recognised that in all care categories the ratio of nurse to baby (ies) may need to increase for some periods of time.

i) Intensive Care:

Due to the complex needs of both the baby and their family the ratio of neonatal nurses QIS to baby should be 1 nurse: 1 baby. This nurse should have no other managerial responsibilities during the time of clinical care but may be involved in the support of a less experienced nurse working alongside her in caring for the same baby.

ii) High Dependency Care:

The ratio of neonatal nurses QIS responsible for the care of babies requiring high dependency care should be 1 nurse: 2 babies. The more stable and less dependent babies may be cared for by registered nurses not QIS, but who are under the direct supervision and responsibility of a neonatal nurse QIS.

iii) Special Care:

The ratio of nurses looking after special care babies should be at least 1 nurse: 4 babies. It is essential that staffing in special care is sufficient to ensure that discharge is properly planned and organised including the adequate support for parents. Registered nurses and non-registered clinical staff may care for these babies under the direct supervision and responsibility of a neonatal nurse QIS.

5 TRADITIONAL MEDICAL ROLES

5.1 Definitions

5.1.1 Traditionally all types of neonatal units have had access to doctors at three levels: A junior level containing doctors new to the specialty, a middle level equivalent to "registrar" who was typically competent to manage the usual range of cases presenting in the short term, and the experienced specialist – a consultant. Given the changes that have occurred in medical training, the restriction on doctors' hours and changes to the organisation of paediatric and neonatal services, this model is no longer entirely feasible. As a result, it is anticipated that some of these traditional medical roles will be taken by nurses and similarly not all three tiers will be maintained in all sites. Therefore the following represents the skill sets and combinations of staff considered appropriate in different settings.

5.1.2 Tier 1 (junior) Roles (indicative not exhaustive):

- Attendance at deliveries and provision of basic newborn life support
- Admission and hour to hour support of infants
- Immediate investigation / acute ventilator management according to pre-agreed parameters
- Basic practical procedures
- Recording progress, observations and examinations in case notes
- Presentation of progress on ward rounds
- Communication with other professional groups and parents appropriate to level of experience
- Obtain training, experience and maintenance of skills
- Routine newborn checks - should normally be undertaken by appropriately trained midwifery staff. All medical trainees should do a number of newborn checks until they are competent to recognise abnormalities and identify normal variants

Staff groups appropriate for this role:

- Medical staff at FY2 & ST1-3, GPST 1-2 level (training and non-training)
- Specialty doctor (up to threshold 1)
- Advanced neonatal nurse practitioners (ANNP)
- Nurses QIS working in roles with enhanced practice skills (ENNP)

All the above will be supported by and are accountable to the Tier 2 and Tier 3 staff.

5.1.3 Tier 2 (competent on site clinician) Roles:

- Attendance at complex deliveries & provision of advanced newborn resuscitation
- Oversee and support all Tier 1 staff on shift by shift basis
- Accountable for immediate care
- Manage more complex infants
- Learn and undertake complex or infrequent procedures
- Undertake intensive care neonatal transfers
- Communicate with other professional groups and parents to a more detailed level appropriate to their knowledge and training
- Obtain and deliver training, gain experience and maintenance of skills

Staff groups appropriate for this role:

- Medical staff at ST3-8 level (training and non-training)
- Specialty doctor (Post threshold 1)
- Advanced neonatal nurse practitioners (ANNP)
- Trained neonatal medical staff (CCT holders)

In general, all the above staff will be accountable to the Tier 3 consultant. However, where the role is undertaken by trained medical staff (CCT holders) appointed to a resident consultant post these individuals will be independent practitioners within the care team equivalent to any consultant and will be accountable to the individual Trust arrangements for consultant staff.

Before an ANNP acts on the middle grade rota units, s/he should ensure and be able to demonstrate that s/he has had sufficient training and experience to meet the competencies described above.

5.1.4 Tier 3 (expert) Roles (Indicative not exhaustive):

- To carry out twice daily neonatal ward rounds
- To be accountable for overseeing patient care under their management
- To teach, train and support the Tier 2 and Tier 1 staff
- To undertake counselling of all levels of complexity
- Working within a team to provide leadership and oversee all management aspects of the neonatal department's functions
- To liaise with other consultants in other disciplines and other Trusts as required.
- To maintain their own skills

Staff groups appropriate for this role are likely to depend on the type of neonatal service that the individuals are expected to cover:

- Special Care and Local Neonatal service:

  - Medical consultants with a CCT in paediatrics or CESR (via article 14) in paediatrics or an equivalent overseas neonatal or paediatric qualification.
  - Demonstrates knowledge and skills appropriate for the level of neonatal care through annual appraisal.

- Neonatal Intensive Care Service:

  - Medical consultants with a CCT in paediatrics (neonatal medicine) or CESR (via article 14) in neonatal medicine, or an equivalent overseas neonatal qualification.
  - Demonstrates knowledge and skills appropriate for the level of neonatal care through annual appraisal.

For all levels of unit it is not appropriate for a consultant to provide out of hours cover to two geographically separate sites simultaneously. Similarly where a consultant or CCT holder is working at tier 2 another consultant should provide tier 3 cover, i.e. a single consultant cannot simultaneously cover at tier 2 and tier 3 if such cover is normally provided by two separate clinicians of appropriate training and experience.

5.2 Requirements for a Special Care Unit (SCU)

5.2.1 Departments will usually be linked with a general paediatric department. Tier 1 staff must be trained in resuscitation of the newborn and be appropriately supported. The overall team should constitute a group of staff who can safely meet the needs of newborn babies from low risk pregnancies, and unexpected emergencies, as defined by the local network.

5.2.2 Recommended numbers of staff for a Special Care Unit:

- Tier 1: Rotas should be EWTD compliant and have a minimum of 8 staff who may cover paediatrics in addition.
- Tier 2: Shared rota with paediatrics comprising a minimum of 8 staff.
- Tier 3: A minimum of 7 consultants on the on call rota with a minimum of 1 consultant with a designated lead interest in neonatology.

5.2.3 It is recognised that in some settings that tiers 1 and 2 may be able to merge especially where appropriate skilled nursing support exists.

5.3 Requirements for a Local Neonatal Unit (LNU):

5.3.1 It is anticipated that teams at each tier will be made up from the following groups:

- Tier 1: Staffing can be from paediatric ST1-2, GPST 1 or FY2, specialty doctors, ENNPs or ANNPs, non training grade doctors.
- Tier 2: Staffing from paediatric ST3-8, specialty doctors, other non training grade doctors, ANNPs, resident paediatric / neonatal consultants.
- Tier 3: A minimum of 7 paediatric / neonatal consultants on the on-call rota.

5.3.2 We recognise that across the UK the nature and volume of neonatal care performed in local neonatal units shows great variation. The “standard” model is that described below:

- Tier 1: Rotas should be EWTD compliant and have a minimum of 8 staff who do not cover general paediatrics in addition.
- Tier 2: Shared rota with paediatrics comprising a minimum of 8 staff, but see 5.3.3.
- Tier 3: A minimum of 7 consultants on the on call rota with a minimum of 1 consultant with a designated lead interest in neonatology. All consultants covering the service must demonstrate expertise in neonatal care (based on training, experience, CPD and on-going appraisal).

5.3.3 Where local neonatal units regularly provide intensive care, and/or have a very busy paediatric service, and/or have neonatal and paediatric services that are physically a significant distance apart, then the above staffing levels should be enhanced. The threshold should be judged and monitored on clinical governance grounds such as the ability to consistently attend paediatric or neonatal emergencies immediately when summoned. At tier 2 such enhanced measures would include separate tier 1 and tier 2 rotas 0900 until 2400 each day or, depending on patient safety, throughout

the 24 hours. At tier 3 units with regular neonatal intensive care activity should have all consultants with expertise in neonatal care.

5.4 *Requirements for a Neonatal Intensive Care Unit (NICU):*

5.4.1 All staffing roles should be limited to neonatal care at all levels, i.e. no cross cover with general paediatrics. It is anticipated that teams at each tier will be made up from the following groups:

- Tier 1: Staffing can be from paediatric ST1-3, ENNPs or ANNPs, specialty doctors.
- Tier 2: Staffing from paediatric ST4-8, specialty doctors, other non training grade doctors, ANNPs (with appropriate additional skills and training), resident neonatal consultants.
- Tier 3: Consultant neonatologists. There will be 24/7 availability of a consultant neonatologist for Tier 3.

5.4.2 Recommended numbers of staff for a Neonatal Intensive Care Unit:

- Tier 1: Separate neonatal rotas with a minimum of 8 staff.
- Tier 2: Separate neonatal rota with a minimum of 8 staff.
- Tier 3: A minimum of 7 consultants on the on call rota with resident consultants on the tier 2 rota additional to this number. All tier 3 consultants should be identified neonatal specialists. See 5.1.4.

5.4.3 For larger Neonatal Intensive Care Units special consideration should be given to the number of staff required at each tier throughout the 24 hours and giving due consideration to the time required at each handover. With increasing size, at some point, essentially the whole of the staffing structure described in 5.4.2 should be doubled. Individual units should be assessed on a patient safety basis.

6 BAPM STANDARDS FOR ALLIED HEALTH PROFESSIONALS

6.1 *Dietetics*

Specialist dietitians have a major role in assessing and improving the nutrition of premature infants. Data exist that document the benefit of including a neonatal dietitian within a team approach to nutritional support.[11 12 13]

In terms of network structure the following principles should be adopted:

- All types of neonatal units should have access to a paediatric dietitian competent in neonatal nutrition or a neonatal dietitian (to include expertise in the care of babies requiring surgery and support after discharge for those babies identified at nutritional risk).

- All paediatric dietitians caring for neonates should have access to a highly skilled specialist neonatal dietitian whose job plan contains sufficient capacity to provide advice and support across the network.

- Dietitians providing neonatal care should be experienced paediatric dietitians who have completed the British Dietetic Association Paediatric Dietetic Masters Module 2 or demonstrate an equivalent level of knowledge and skills.

- Specialist neonatal dietitians must be experienced neonatal dietitians capable of providing network support in complex neonatal and surgical dietetics and have completed the BDA Masters Paediatric Dietetic Module 5 (Neonatal Nutrition) or demonstrate an equivalent level of knowledge and skills.

- The dietetic workforce should be based on the Modernisation Taskforce Critical Care Workforce Standards[14] and provide a minimum of 0.05 – 0.1wte per intensive care cot The higher level of provision should be provided at NICU level in order to enable the provision of a network support service in addition to complex unit based nutritional support. Consideration should also be given to provision for the ongoing need for nutritional support to at risk infants after discharge.

6.2 Occupational Therapy and Physiotherapy in the NICU

6.2.1 Models of Provision:

Physiotherapy and Occupational Therapy involvement in relation to newborn care have followed different patterns across the UK. Some services have successfully utilised a joint role where the focus has been on “developmental care” whilst in other parts of the UK the roles of the individual therapists have remained separate with a focus on the contribution that each can provide. Networks and neonatal services will need to consider which pattern of service most closely suits their needs.

6.2.2 Developmental Role:

It is widely accepted that neonatal occupational therapy (OT) and neonatal physiotherapy (PT) have a shared knowledge base and competencies in relation to the highly specialized area of a NICU. Therefore there is much overlap between the two professions when both adopt a developmental model, which is increasingly becoming the standard for care in NICU. In order to capitalise on this overlap neonatal OT and PT agree that it is necessary to be able to shift away from solely focusing on individual practice areas to a more collaborative model with other professionals, using this shared knowledge base and providing in some cases developmental leadership to the NICU team. What is unique to OT and PT in this complex area is the ability to combine comprehensive assessment with appropriate intervention.

Therefore to avoid duplication and for more effective use of resources a neonatal post may be split between OT and PT to provide a comprehensive service. The number of whole time equivalents should reflect the size of the individual unit and any additional commitment to provide specialist input to the wider network. Where it is not possible to recruit both OT and PT, a neonatal therapist may be employed (either OT or PT) with the appropriate skill base, knowledge and experience to provide developmentally based neurological / neurobehavioural assessment and follow up of the high risk infant.

6.2.3 Neonatal Physiotherapy – Specialist Role:

The neonatal physiotherapist is a specialist in:

- Age appropriate movement and postural control
- Assessment and identification of gross motor dysfunction within the behavioural, environmental, and family context of the NICU.[15 16]
- Shaping the musculoskeletal system and motor organization of infants requiring intensive care and to support parents and caregivers in optimizing infant brain development during the NICU stay, relying on principles of movement science.[16]

Other areas of practice specific to physiotherapy include chest physiotherapy and the management of orthopaedic conditions such as Erb's Palsy and talipes.

There are currently no benchmarked standards regarding WTE posts per service capacity. Due to the specialist nature of the work it is recommended that the post be Band 7 or band 8A (depending on experience).

All specialist neonatal physiotherapists will need to demonstrate their on-going skills and knowledge through annual appraisal with evidence through their CPD portfolio.

6.2.4 Neonatal Occupational Therapy – Specialist Role:

The neonatal occupational therapist is a specialist in:

- Assessing the interaction of biological, developmental and psychosocial aspects of human function as expressed in daily activities and occupations.[17, 18, 19]
- Administering complex standardised neurobehavioral assessments that provide information on the infants neurobehavioural organisation, state control and self regulatory behaviours.
- The use of reliable non-invasive neurological assessments to identify early signs of neurological impairment.
- Identifying and advising on sensory issues affecting irritable babies and provide advice on developmentally supportive positioning to help prevent postural and developmental delays later in infancy.[16 17]
- Helping to sensitise parents to their infant's behavioural cues, thereby enabling appropriate interactions and levels of stimulation, and provide developmental programmes as appropriate.[17 18 20]
- Provide follow up after discharge, using evidence based standardised developmental, cognitive and motor assessments.

The neonatal occupational therapist is a key member of the multidisciplinary team who will be expected to have the appropriate specialised post-graduate training and skills.[17 18 20 21 22 23] All specialist neonatal OT's will need to demonstrate their on-going skills and knowledge through annual appraisal with evidence through their CPD portfolio.[17]

There are currently no benchmarked standards regarding WTE posts per service capacity. Due to the specialist nature of the work it is recommended that the post be Band 7 or band 8A (depending on experience).

6.3 *Speech and Language Therapy*

6.3.1 Roles/Benefits

The speech and language therapist (SLT) is a key member of the multidisciplinary neonatal team with a unique role in the assessment and management of infant feeding and swallowing.[24]

A knowledge of feeding development and early communication skills enables provision of pre-feeding intervention programmes with the aim of:

(i) reducing the potential development of aversive feeding behaviour

(ii) promoting oral feeding readiness

(iii) maximising the potential for successful oral feeding[25]

An integral part of the SLTs role is to support and provide education to the multi-disciplinary team regarding optimal feeding practice and the management of infants with complex feeding and swallowing problems.

6.3.2 Network staffing model

All units should have access to the specialist SLT services. The precise staffing model will reflect the size and configuration of the network. Neonatology is an advanced practice sub speciality area within paediatric SLT. Speech and language therapists working in this specialty should have relevant post graduate paediatric experience and evidence of relevant CPD.

6.4 *Pharmacy*

6.4.1 Neonatal Pharmacy

Neonatal pharmacists play a role in the optimisation of drug therapy in the critically ill neonate through:

- Prescription monitoring
- Provision of advice on the use of off-label and unlicensed medicines, including suitable formulations, to enable safe therapy
- Pharmaceutical optimisation of intravenous therapy (for example the administration of complex infusions because of limited venous access) to ensure that medication can be administered safely and effectively
- Optimisation of parenteral nutrition
- Therapeutic drug monitoring
- Adverse drug reaction prevention, treatment, monitoring and reporting
- Minimising the potential for medication errors through guideline development, provision of medicines information, teaching of other healthcare professionals and drug interaction prevention

Networks should ensure that there are sufficient paediatric pharmacists trained in neonatal intensive care, who have time in their job plans allocated for their work on the neonatal unit[1]. It is recommended that the time allocated should be based on the ability to provide daily input of approximately 10 - 20 minutes per cot to the care of all patients as well as attendance at appropriate ward rounds and meetings (based on the recommendation of the neonatal pharmacy special interest group). The time

required should also reflect the case mix of patients and various local factors such as:

- Access on site to a pharmacist experienced in neonatal and paediatric parenteral nutrition
- Provision of an aseptic preparation service for all parenteral nutrition and the majority of intravenous injections and infusions
- Access to a drug information service with experience in the problems of neonatal intensive care
- Pharmaceutical lead or input to drug-related policies, protocols and guidelines
- Responsibilities to the wider network
- Continuing education of pharmacy practitioners providing the service

Pharmacists providing neonatal care should be suitably trained and experienced and as a minimum, have successfully completed the Centre of Postgraduate Pharmacy Education paediatric distance learning pack or have equivalent levels of skills and knowledge. They must have a detailed knowledge of pharmacokinetics and dynamics in neonates and understand the development of the major metabolic pathways and how these affect common paediatric medication.

6.5 *Psychological Support*

All parents whose babies are admitted into a neonatal unit suffer stress and particularly in NICUs they may experience significant trauma with the possibility of post traumatic stress symptoms.[26] All parents should have access to a trained counsellor. In units providing intensive care this service should be available without delay from the time of admission as well as providing for ongoing support during the parents' time on the neonatal unit. The work should include specialist bereavement counselling in conjunction with the clinical team.

Additional roles include staff support and education. The level of service provided should reflect the needs of the whole network and not just babies within NICUs.

6.6 Social Services

Although social services are not normally an integral part of the "health services" associated with neonatal care, networks should ensure that they have clear arrangements to facilitate close working with the relevant local children's social work teams.

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