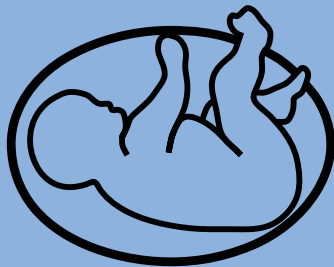


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# Matching knowledge and skills for Qualified In Speciality (QIS) Neonatal nurses:

A core syllabus for  
clinical competency



Scottish Neonatal  
Nurses' Group



Neonatal Nurses Association

## Working group membership

**Sue Turrill, Chair of working group**, Lecturer Neonatal Care, School of Healthcare, University of Leeds. BAPM representative (Nursing & Midwifery).

**Jane Abbott**, Head of programmes, Bliss.

**Chris Ashworth**, Matron (Education and Governance), Central Manchester Hospitals NHS Trust and Greater Manchester Neonatal Network Education Lead.

**Mark Broom**, Senior Lecturer Child Health, University of Glamorgan, Pontypridd.

**Glenys Connolly**, Advanced Neonatal Nurse Practitioner, Plymouth NHS Trust.

**Denise Evans**, Network Lead Nurse, Yorkshire Neonatal Network.

**Joan Foy**, Senior Nurse Manager, Wales Neonatal Networks.

**Yvonne Freer**, (representing SNNG), Clinical Reader, Simpson Centre for Reproductive Health, Edinburgh and Edinburgh Napier University

**Katie Gallagher**, Lecturer in Child Health, Kings College London. Lead for the NNA Special interest education group.

**Sharon Nurse**, Senior Teaching Fellow (Midwifery and Family Health), School of Nursing and Midwifery, Queens University, Belfast.

**Tina Pollard**, Clinical Service Manager Neonatal Services, Cambridge University Hospitals NHS Foundation Trust. Chair of the Neonatal Nurses Association.

**Susanne Simmons**, Senior Lecturer Neonatal/Child Health, School of Nursing and Midwifery, University of Brighton.

**Una Vujakovic**, Network Manager, South Central Neonatal Network.

Group members include key representatives of both NHS and higher education roles within neonatal nursing in the UK. This also involves the expertise of neonatal professional bodies. Wider consultation included Network Lead nurses, BAPM nurse members, NNA executive members and the SNNG executive. This document is therefore presented as a professional consensus and as a joint publication from BAPM, NNA and the SNNG.

©British Association of Perinatal Medicine (BAPM), 5 – 11 Theobalds Road, London, WC1X 8SH  
Tel: +44 (0)20 7092 6085. Fax: +44 (0)20 7092 6001. Email: [bapm@rcpch.ac.uk](mailto:bapm@rcpch.ac.uk). Website: [www.bapm.org](http://www.bapm.org)  
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## Introduction

The provision of specialised post-registration nurse education in the UK currently exists within the quality framework of Higher Education Institutions. This includes the validation of individual courses and programmes of study leading to the recognition of 'qualified in specialty' status (QIS) for neonatal nurses. These post registration education pathways, in collaboration with service providers, allow for registered nurses working in neonatal units to become equipped with the specific knowledge and skills to practice safely and effectively in this critical care area.

Since the loss of the role of the National Boards and the Nursing and Midwifery Council (NMC) in monitoring and regulating post-registration course content, anecdotal reports from NHS Trusts and Neonatal Networks have highlighted the lack of standardisation in both skills development and supporting knowledge for QIS nurses, particularly when nurses transfer between neonatal units and other parts of the country. In addition the potential changes to the commissioning of specialised nurse education pathways may result in a more diverse range of providers existing outside the framework of both professional nursing standards and Higher Education Institutions (HEI), resulting in increased disparity between qualified neonatal nurses.

During 2009 the Royal College of Nursing (RCN) initiated work to develop a UK framework for careers and education in neonatal nursing (RCN, 2011). This had a basis in preceding work from the Scottish Neonatal Nurses Group and NHS Education Scotland (SNNNG, 2005) in determining a career and development framework for neonatal nurses in Scotland. Since 2005 the Scottish careers framework has been updated (NES, 2010) and adopted in all 16 neonatal units in Scotland and is utilised for education provision by Edinburgh Napier University. More recently providers within two English Neonatal Networks have incorporated skills elements of the framework within their programmes of study (CCCU, 2005; YNN, 2009).

Whilst a clear framework for the teaching and assessment of skills has now been published, the uniformity of knowledge matched to these skills has not been determined.

With this in mind a professional neonatal nurse consensus group, representing all UK countries, was convened in February 2011 to address concerns around consistency in the content of QIS education and training programmes.

## The context of QIS nurses in neonatal care

In the last five years the response to the National Audit Office report (NAO, 2007) into neonatal care delivered in the UK has resulted in the publication of government and professional standards (DH, 2009; BAPM, 2010, NICE, 2011). Within all these frameworks for care clear recommendations are made for the role of the QIS nurse as a central member of the nursing workforce.

QIS nurses provide a pivotal role in workforce strategy, not only in providing direct clinical care to babies and families. Once qualified they are able to develop further into more specialised clinical practice areas (eg stabilisation and transport, breast feeding advisor, outreach nurse), or enhance their practice skills/knowledge (eg intubation, cannulation, surgical nursing), and undertake development to advanced practice level. They are also vital for supporting the foundation learning of novice nurses in neonatal areas.

National drivers for nursing include standardisation of levels of competence (DH, 2008). Competence in practice relies on the assessment of knowledge and understanding, and in skills performance. At QIS level the expectation is for the neonatal nurse to be able to apply knowledge to practice in terms of rationalising judgements, problem solving and making clinical decisions in order to optimise infant outcomes.

Whilst recognising that knowledge acquisition is relevant to all stages of career development, this document will therefore concentrate on defining the essential core elements required in the syllabus and map them to performance skills at QIS level.

## Aims & purpose

Uniformity of qualification and competence throughout the UK can only be achieved by providing clear expectations of a standard knowledge content that supports skills performance in practice. Initial discussion within the group identified 4 sections to support standard qualification. These were, knowledge content (mapped to skills), transferable evidence of achievement, mentor guidance for assessment of knowledge transfer in practice, and identified aspects of quality inherent in education provision. It became clear early in the development of the document that the knowledge content for courses mirrored that expected of mentors in assessing students in practice. This document therefore sets out the following 3 sections:

- Essential core syllabus (knowledge) and skills content for QIS
- Criteria for evidencing achievement of knowledge and skills through the development of a transferable portfolio.
- Identified key measures of quality for education provision.

Utilisation of the document is seen to be an important strategy at all levels of nursing. This includes:

- Development of workforce education and training strategies
- Partnership between Neonatal Networks/Trusts and Skills Networks in commissioning education programmes
- Education providers for determining consistent course content and devising practice assessment documentation
- Clinical Educators/Mentors in formalising assessment of practice knowledge
- Defining expectations for practitioners in training.

It is envisaged this document will initially be utilised as a measuring tool to map current provision and provide a framework for development of future education modules and programmes of study.

## Clinical competency

Competency within the RCN guidance (2011) at QIS level is presented across the seven Knowledge and Skills Framework (NHS, 2004) core dimensions:

- Communication and interpersonal relationships
- Personal, professional and people development;
- Health, safety and security;
- Service development;
- Quality
- Equality and diversity and rights;
- Responsibility for patient care.

With the exception of 'Responsibility for patient care' the competences relate to focusing generic nurse practices on neonatal care, by integrating the skills and knowledge already learnt during pre-registration preparation, into these domains. It is within the final dimension where the unique knowledge and skills exist which defines the competence specific to this specialised area of practice

It was clearly appropriate, with the important work developed from both the RCN and the SNNG, to map essential course content, a core syllabus, to the 'Core clinical skills set for Neonatal Nurses' defined within both these guidance documents under this dimension (RCN, 2011; NES, 2010). In this way the standard of competency specific to neonatal nursing is distinct and a measuring tool for essential knowledge and skills development is defined

Due to the nature of HEI programme structure and development, education providers in partnership with care providers may choose to include elements of other dimensions within specialised neonatal education pathways. It is envisaged that these will be determined locally or may exist within individually defined personal or service development plans.

## SECTION 1: Knowledge and skills.

Nursing care which prioritises positive infant development has a basis in maintaining physiological stability in order to protect the developing brain and prevent other co morbidities, along with promoting family stability thus enhancing parent-infant relationships. The core skills and knowledge reflect both these elements and form the basis of a developmentally and family centred approach to care.

Treatments and consequently skills have developed within neonatal nursing in the last nine years since the original publication of SNNG skills portfolio (NES, 2002). Therefore the working group, with the kind permission of the current chair of the SNNG, reviewed and revised the core skills set to reflect contemporary practice and expectations of the QIS nurse. This revision maintains the original framework whilst recognising that elements of the 'equipment' skill is encompassed within the generic competences and 'investigations and procedures' are inherent throughout all other systems based skills. The addition of 'skill 6 - Managing and supporting the family' - acknowledges the wealth of knowledge and evidence now available that supports practice in relation to the discrete experience of the family in neonatal care.

Reaching QIS level includes previous achievement of foundation knowledge and skills (eg foundation neonatal module; neonatal occupational standards; in-service preparation programme) prior to formal specialised education. The assumption in terms of the career pathway is that novice registered nurses have already demonstrated achievement of level 1 skills and associated knowledge.

Essential knowledge mapped to the systems based skills is presented in two sections: the bioscience based knowledge of neonatal anatomy and physiology, altered physiology of underdevelopment, and pathology; and congruent to this the knowledge of practice strategies and responses to conditions and abilities. Together this knowledge underpins decisions made in practice relevant to specific care practices and outcomes.

Performance criteria for skills assessment and knowledge content supporting practice are presented as:

1. Fluid, electrolyte, nutrition and elimination management
2. Respiratory and cardiovascular management
3. Neurological, pain and stress management
4. \*Skin, hygiene and infection prevention management
5. \*Management of thermoregulation
6. Managing and supporting the family

(\*Note that due to the relationship between the skin and thermoregulation the knowledge content relating to these skills is presented as a single section)

### The range of care provision

Neonatal care exists across a range of maturity, conditions and situations. It is expected, therefore, that achievement of knowledge and skills will encompass the complete range identified below:

- Gestational ages of neonates from extremely preterm to post term
- Birthweight ranges: extremely low birthweight (<1000g), very low birthweight (<1500g), low birthweight (<2500g), normal birthweight, intrauterine growth restriction, large for gestational age;
- Physical condition, identification of continuing improvement or deterioration;
- Neonates with differing conditions requiring surgery;
- Neonates with congenital anomalies;
- Neonates preparing to be discharged home;
- Neonates being transferred within and between differing hospital settings.

(BAPM, 2010)

**Elements of knowledge that overarch all skill development:**

<b>Universal</b>
All elements of all skills and knowledge reflect and demonstrate current evidence based practice
Skills and knowledge achievement includes demonstration of safe administration of relevant drugs in all situations in accordance with professional policies, and the ability to assess and evaluate responses.

## Skill 1. FLUID, ELECTROLYTE, NUTRITION AND ELIMINATION MANAGEMENT

<b>Neonatal Nurse QIS – performance criteria</b>
<ul style="list-style-type: none"> <li>• Recognise abnormal gastrointestinal and urinary tract function, abnormal bilirubin elimination, acting on deviations</li> </ul>
<ul style="list-style-type: none"> <li>• Assist and support the mother to breastfeed</li> <li>• Inform and advise on storage of breast milk, breast feeding, hand and mechanical expression and supplementary methods of feeding</li> </ul>
<ul style="list-style-type: none"> <li>• Inform and advise carers on all aspects of other enteral feeding methods</li> </ul>
<ul style="list-style-type: none"> <li>• Assess enteral feeding needs, devise plan and evaluate effectiveness</li> <li>• Monitor the need for nutritional supplements</li> <li>• Refer to specialist neonatal nutrition advisor (eg dietician, speech and language therapist)</li> </ul>
<ul style="list-style-type: none"> <li>• Set up, maintain and discontinue intravenous /intra-arterial therapy.</li> <li>• Maintain central lines</li> <li>• Intervene appropriately to reduce/avoid deviations/ complications</li> </ul>
<ul style="list-style-type: none"> <li>• Measure &amp; interpret intake and output, assessing hydration status</li> <li>• Calculate requirements according to clinical condition and guidelines</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor growth through measurement of weight and head circumference.</li> <li>• Identify deviations from expected growth and refer as required</li> </ul>
<ul style="list-style-type: none"> <li>• Interpret results of blood glucose measurement</li> <li>• Implement interventions for blood glucose regulation according to locally agreed protocols</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor and measure serum bilirubin levels</li> <li>• Initiate phototherapy according to NICE jaundice guidelines</li> <li>• Care for the baby requiring phototherapy</li> <li>• Care for the baby receiving exchange and partial exchange transfusion</li> </ul>



## Knowledge 1. FLUID, ELECTROLYTE, NUTRITION AND ELIMINATION MANAGEMENT

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Normal newborn or convalescing infant:</b>	<b>Practice knowledge</b>
<p><i>Anatomy, physiology &amp; functioning of gastrointestinal system to include:</i>                      Transition to extrauterine nutrition:                          Newborn gut structure &amp; function                          Development of suck, breathe and swallow reflexes                          Newborn control of blood glucose                          Expected growth patterns</p> <p>Glucose use and homeostasis                      Storage of nutrients e.g. glycogen, subcutaneous fat                      Risk factors for hypoglycaemia</p> <p>Bilirubin metabolism; physiological jaundice</p> <p><i>Anatomy, physiology &amp; functioning of renal system to include:</i>                      Renal function: Role in:                      water homeostasis; reabsorption of electrolytes; excretion; acid-base balance.</p> <p>Sensible and insensible water losses in the newborn</p>	<p>Process of nutritional adaptation to extra-uterine life in healthy term newborn.                      Recognition &amp; assessment of normal feeding reflexes.</p> <p>Feeding strategies &amp; expectations – Breast feeding principles (BFI); artificial feeding                      Positive and negative aspects of both strategies                      Safe preparation, storage and delivery of artificial milk</p> <p>Normal blood glucose value range, recognition of signs of low blood glucose</p> <p>Normal values for bilirubin at birth and subsequently                      Relevance of cord bloods in mother who is Rhesus negative or where other blood group incompatibilities are known                      Significance of visible jaundice &lt;24hours of age                      Expectations for progressive/reducing jaundice</p> <p>Fluid requirements                      Normal elimination patterns e.g. time to first voiding/passage of meconium                      Monitoring and measurement of growth.</p> <p>Relevance of urinary pH/specific gravity                      Relevance of glycosuria/leucocytes/haematuria/proteinuria                      Expected urine output</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Altered anatomy and physiology</b> ( <i>IUGR, underdevelopment, associated conditions eg infant of diabetic mother, infant with chronic lung disease</i> )	<b>Practice knowledge</b>
<p>Characteristics of Intrauterine growth restriction (IUGR), associated risk factors and conditions, compromise to physiology and function, outcomes. Factors affecting postnatal growth</p> <p>Maternal conditions affecting fetal/infant nutritional state eg Insulin Dependant Diabetes Mellitus, placental insufficiency, multiple pregnancy Recognised fetal risk factors for gut compromise eg fetal assessment parameters</p> <p>Risk associated with increased Trans-epidermal water loss (TEWL) Causes and consequences of hypo and hypernatraemia</p> <p>Mechanisms of altered glucose metabolism and identification of 'at risk' groups Causes and consequences of hypo and hyperglycaemia</p> <p>Gastro-oesophageal reflux – causes &amp; outcomes</p> <p>Risk factors likely to increase level of physiological jaundice</p>	<p>Expected growth patterns &amp; monitoring and measurement strategies. Caloric (energy) requirements Deviations in growth</p> <p>Assessment of reflexes in prematurity with reference to infant feeding ability Principles of breast feeding preterm infants – expression and storage of milk Differences for IUGR/ LBW &amp; preterm feeding patterns Feeding strategies for breast feeding/artificial feeding</p> <p>Positive and negative aspects of oral /nasal enteral feeding Components and use of different types of artificial milks ie term/preterm/pre-digested; supplementation and milk fortifiers</p> <p>Calculation of fluid requirements; monitoring of fluid balance; estimation of insensible losses; use of diuretic therapy Expected urine output – causes of oliguria/polyuria Skin integrity and management strategies for reducing TEWL</p> <p>Infant of diabetic mother – monitoring/ feeding Blood glucose monitoring - normal &amp; expected blood glucose values Pre-emptive feeding regimes patterns Management of hypoglycaemia; Increasing volumes or concentrations of fluids Medicines management specific to hypoglycaemia – use of glucagon</p> <p>Gastro-oesophageal reflux – management strategies (feeding, positioning &amp; medications)</p> <p>Use of phototherapy – mechanism/ application/ expectations &amp; impact on other systems</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Pathophysiology</b>	<b>Practice knowledge</b>
<p><b>For all conditions:</b> Risks, causes, affect of pathology on functional ability of all systems, long and short term outcomes.</p> <p><i>Congenital anomalies:</i></p> <p>Structural &amp; functional gastrointestinal tract pathologies: eg cleft lip and palate, trache-oesophageal fistula, atresias, abdominal wall defects, malrotation, Hirshprung's disease</p> <p><i>Acquired gut pathologies due to extreme prematurity:</i> eg Necrotising enterocolitis, short gut syndrome</p> <p><i>Term infants with birth depression:</i> eg Acute renal failure – Acute Tubular Necrosis, central nervous system control of feeding</p> <p>Consequences and outcomes of chronic under nutrition.</p> <p>Causes and consequences of pathological jaundice. Infants at risk of pathological jaundice Haemolytic disease – risk factors, causes and consequences</p>	<p>Immediate priorities for managing an infant with known pathology at birth.</p> <p>Risks &amp; benefits associated with use of peripheral venous lines Principles, risks and benefits of safely managing central line access ie umbilical vein/arterial lines, percutaneous venous long lines and peripheral arterial lines</p> <p>Contraindications to enteral feeding Use of parenteral nutrition</p> <ul style="list-style-type: none"> <li>• Constituents, administration, risks &amp; benefits</li> <li>• Nutritional status and expected growth patterns</li> </ul> <p>Use, benefits and regimes for trophic feeding</p> <p>Recognition and management of renal failure and fluid overload Situations leading to fluid restriction or liberation.</p> <p>Post surgical feeding regimes – potential growth implications</p> <p>Principles of exchange transfusion including systemic effects</p>

## Skill 2: RESPIRATORY AND CARDIOVASCULAR MANAGEMENT

Neonatal Nurse QIS – performance criteria
<ul style="list-style-type: none"><li>• Recognise deviations from normal respiratory and cardiovascular function</li><li>• Interpret trends in the results of blood gas analysis</li></ul>
<ul style="list-style-type: none"><li>• Intervene to restore/maintain homeostasis</li></ul>
<ul style="list-style-type: none"><li>• Recognise need for and request assistance in relation to basic life support</li><li>• Perform basic life support</li><li>• Assist with advanced resuscitation and stabilisation</li></ul>
<ul style="list-style-type: none"><li>• Initiate oxygen therapy via head box, nasal cannulae and facially</li><li>• Initiate respiratory support via the use of nasal continuous positive airways pressure (CPAP) or high-flow oxygen systems</li><li>• Safely care for the baby with a supported airway</li><li>• Safely care for the baby requiring all methods of mechanical ventilation and respiratory support</li></ul>
<ul style="list-style-type: none"><li>• Assess the need for suction of respiratory secretions</li><li>• Use safe and effective oral and nasal suction techniques</li><li>• Use safe and effective endotracheal tube/tracheostomy suction techniques</li><li>• Perform chest physiotherapy techniques utilising an agreed plan of care</li></ul>
<ul style="list-style-type: none"><li>• Recognise the need for intubation/extubation</li><li>• Assist with elective / emergency intubation</li><li>• Perform extubation</li></ul>
<ul style="list-style-type: none"><li>• Assist with the insertion/removal of chest drain</li><li>• Provide care for baby with chest drain in situ</li></ul>

## Knowledge 2: RESPIRATORY AND CARDIOVASCULAR MANAGEMENT

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Normal newborn and convalescing infant</b>	<b>Practice knowledge</b>
<p><i>Anatomy, physiology &amp; functioning of cardio- respiratory system to include:</i></p> <p>The fetal circulation &amp; structures            Cardio-respiratory adaptation to extra-uterine life            Requirements for successful respiration:</p> <ul style="list-style-type: none"> <li>• Structural development: Lungs, alveoli, airways, pulmonary circulation, respiratory pump</li> <li>• Control of breathing, normal breathing patterns</li> <li>• Gas transport, gaseous exchange</li> <li>• Ventilation perfusion balance</li> <li>• Energy to breathe</li> </ul> <p>Normal newborn cardiac function, cardiac output, Blood Pressure(BP)</p>	<p>Normal newborn parameters for Heart Rate, BP, Respiratory Rate, perfusion            Normal newborn breathing patterns            Relevance of deviations from normal</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Altered anatomy and physiology</b>	<b>Practice knowledge</b>
<p><i>Reduced development of cardio-respiratory system due to prematurity:</i></p> <p>Underdeveloped anatomy (respiratory structures and control mechanisms)            Failure to adapt from fetal circulation (causes eg Pulmonary Vascular Resistance, low O<sub>2</sub>, lung fluid) Role and function of alveolar surfactant; factors affecting surfactant production            Transient Tachypnoea of the Newborn            Adapted breathing patterns            Factors affecting O<sub>2</sub> uptake and delivery to tissues – the oxy-haemoglobin dissociation curve; relationship between oxygen saturation and partial pressure of oxygen            Auto regulation of blood pressure: normal values</p> <p>Introduction to blood gas analysis: language, definitions &amp; values</p>	<p>Assessment of cardio-respiratory function            Assessment of perfusion &amp; responses to under perfusion            Significance of Toe/ Core perfusion monitoring</p> <p>Monitoring and management of infants having apnoea, bradycardia and desaturations</p> <p>Principles of basic and advanced life support; priorities for management of collapse</p> <p>Available options for giving supplemental oxygen therapy / increased respiratory support</p> <p>Strategies available for monitoring effectiveness of therapeutic interventions            Risks, benefits of intervention &amp; expected changes to measured parameters            Accepted values for SaO<sub>2</sub>/transcutaneous monitoring at varying gestations            Invasive vs. non invasive BP monitoring</p> <p>Relevance of positioning of infants to optimise respiratory function and interventions</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Pathophysiology</b>	<b>Practice knowledge</b>
<p><b>For all conditions:</b> Risks, causes, affect of pathology on functional ability of all systems, long and short term outcomes.</p> <p><i>Pathology of conditions leading to specific or overwhelming compromise in cardio-respiratory function:</i> eg Patent Ductous Arteriosus; Meconium Aspiration Syndrome; Persistent Pulmonary Hypertension of the Newborn; Respiratory Distress Syndrome; Neonatal asphyxia: structural cardiac defects</p> <p>Effect on oxygen delivery to tissues &amp; removal of waste products of respiration.</p> <p>Deranged blood gases, causes and impact on function of other systems</p>	<p>Assessment and monitoring of cardiorespiratory status, expected parameters</p> <p>Principles involved in intubation/extubation. Management of infant with Endo-tracheal tube in situ; relevance of positioning &amp; patency of tube, Principles of care of an infant with a tracheostomy</p> <p>Risks and benefits, associated with suctioning of respiratory secretions including changes to haemodynamics and cerebral blood flow.</p> <p>Positioning of infants to optimise respiratory therapies Principles underpinning mechanical ventilation/ respiratory support techniques, Measures taken to determine effectiveness Understanding of how respiratory support responds to specific pathology Understanding relevance of altered blood gas analysis</p> <p>Management of infants with chest drains in situ – support of drains and tubing / positioning of infant / potential complications</p> <p>Priorities for managing infants during cardiovascular collapse.</p>

### Skill 3: NEUROLOGICAL, PAIN AND STRESS MANAGEMENT

<b>Neonatal Nurse QIS – performance criteria</b>
<ul style="list-style-type: none"><li>• Recognise expected reflexes and behaviour of babies of differing gestational ages</li><li>• Recognise deviations from expected reflexes and behaviours associated with neurological deficits and report results</li><li>• Recognise physiological and behavioural differences between stress, distress, discomfort, pain, convulsions and drug withdrawal</li></ul>
<ul style="list-style-type: none"><li>• Utilise a validated, gestational age relevant pain assessment tool</li><li>• Interpret outcomes of pain assessment</li><li>• Alleviate baby's discomfort, pain and stress using pharmacological and non-pharmacological methods</li><li>• Implement strategies that minimise noxious and painful experiences</li></ul>
<ul style="list-style-type: none"><li>• Interpret outcomes of assessment of neonatal abstinence syndrome (NAS)</li><li>• Implement strategies that minimise the adverse effects of NAS</li><li>• Provide support and guidance for staff/carers involved in care associated with maternal drug dependency and NAS</li><li>• Initiate referrals related to ongoing need and support in relation to NAS</li></ul>
<ul style="list-style-type: none"><li>• Assess the neonatal environment in relation to neurodevelopment</li><li>• Implement strategies that minimise the adverse impact of the neonatal environment on neurodevelopment.</li><li>• Implement strategies that promote positive musculo-skeletal development</li><li>• Adapt strategies to meet the needs of specific babies</li></ul>



### Knowledge 3: NEUROLOGICAL, PAIN & STRESS MANAGEMENT

<b>Anatomy and physiology (structure, function &amp; process)                      Normal newborn and convalescing infant</b>	<b>Practice knowledge</b>
<p><i>Anatomy, physiology &amp; functioning of central and peripheral nervous system:</i></p> <p>Macroscopic structure and function of the Central Nervous System (CNS):                      Functional areas of cerebral hemispheres; motor and sensory function;                      memory, language and cognition.                      Role and function of Cerebrospinal Fluid (CSF);                      Motor functional development (Peripheral Nervous System); development                      of hearing and vision</p> <p>Role and development of germinal matrix; cerebral blood flow                      Development of reflexes</p> <p>Development of pain pathways, sensation and processing pain; pain                      perception; pain modulation                      Normal physiological and behavioural response to pain</p> <p>Acute and chronic stress, causes &amp; responses</p>	<p>Expected behaviour patterns for healthy term baby;                      Expected reflexes and response of healthy term baby;</p> <p>Overt signs of pain and distress                      Strategies to promote comfort and sleep</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Altered anatomy and physiology</b>	<b>Practice knowledge</b>
<p>Antenatal/perinatal factors contributing to brain injury e.g. Chorioamnionitis post-natal pyrexia, neonatal asphyxia</p> <p>Impact of physiological instability on the developing brain including hypoxia, hypo/hypercarbia, HR, BP and T stability; Cerebral blood flow (CBF). Auto regulation of CBF; impact of reduced auto regulation ; links to development of Germinal matrix-intraventricular haemorrhage</p> <p>Retinopathy of prematurity – vascularisation; risk factors, causes and consequences of damage to retina</p> <p>Impact of short and long term pain and stress on systems (eg cardiorespiratory system, gut motility, hypo and hyperglycaemia, altered immunity, fluid retention) Ability to respond to stress.</p> <p>Neurodevelopmental outcomes of care Relevance of physiological stability to neurodevelopment;</p> <p>Effect of prematurity on musculo-skeletal development; flexion-extension balance; impact on developmental milestones.</p>	<p>Impact of care practices on CBF eg head positioning, ET suction, rapid volume expansion</p> <p>Relevance of parameters when monitoring oxygen saturation</p> <p>Strategies to reduce noxious stimuli; Physiological and behavioural signs of pain and stress. Pain assessment tools; generalised and specific responses to painful stimuli;</p> <p>Non Pharmacological strategies for comfort and pain relief including non-nutritive sucking, swaddling, sucrose/breast milk</p> <p>Pharmacological strategies for pain relief including anticipation of side effects; eg opiate and sedatives via enteral and Intra Venous routes</p> <p>Effects of neonatal environment on physiological stability (ie handling, light, noise, temperature); Strategies to promote comfort and physiological stability. Strategies and rationale for supported infant positioning that promote normal musculo-skeletal development</p>

Anatomy and physiology (structure, function & process) Pathophysiology	Practice knowledge
<p><i>Causes and risk factors associated with brain injury</i> Outcomes of brain injury and impact on behaviour, motor, sensory and cognitive function (to include structural neural tube defects)</p> <p>Hypoxic-ischaemic encephalopathy (HIE); acute profound asphyxia, prolonged partial asphyxia; Grading of HIE Principles of therapeutic cooling</p> <p>Impact on other body systems (eg hypoglycaemia, immunity, respiratory compromise, feeding difficulties)</p> <p>Impact of drug misuse including alcohol and tobacco on behaviour; Impact of drug withdrawal on other body systems (eg tone, activity, irritability, feeding, breathing patterns, temperature regulation); Ante-natal and long term impact of NAS on growth and development;</p> <p>Peri-Ventricular Leucomalacia; loss of white matter, development of cystic areas</p> <p>Grades of Intra-Ventricular Haemorrhage; ventricular dilatation; development of hydrocephalus; parenchymal lesions</p>	<p>Signs of hypoxic ischaemic encephalopathy: expected behaviour, posture &amp; tone, reflexes, irritability, seizures Use of anti convulsive agents *Cerebral function monitoring *Priorities for active and passive cooling – criteria (*this experience may not be available to all)</p> <p>Expectations of ability in relation to: Respiration; feeding; reflex responses; head growth</p> <p>Expected signs &amp; symptoms of withdrawal of different drugs Assessment tool for Neonatal Abstinence Syndrome (NAS) Non-pharmacological strategies to reduce stress and discomfort in baby suffering from NAS; Pharmacological management of drug withdrawal; Specific feeding strategies linked to NAS Support mechanisms available within and outside the hospital setting for families affected by drug misuse.</p> <p>Management of infant with developing hydrocephalus e.g. baby undergoing lumbar puncture / ventricular tapping baby with shunt in situ Understanding of prognosis and need for continued follow up for all babies 'at risk' of compromise</p>

#### **Skill 4: SKIN, HYGIENE AND INFECTION PREVENTION MANAGEMENT**

<b>Neonatal Nurse QIS – performance criteria</b>
<ul style="list-style-type: none"><li>• Educate family/carers in correct hand hygiene techniques</li><li>• Ensure compliance with infection prevention guidelines to include principles of barrier nursing</li></ul>
<ul style="list-style-type: none"><li>• Assess skin integrity anticipating the baby at risk of iatrogenic skin damage</li><li>• Utilise strategies to maintain hygiene and skin integrity, including stoma care</li><li>• Implement strategies to minimise iatrogenic damage and potential injury</li></ul>
<ul style="list-style-type: none"><li>• Recognise expected wound healing processes</li><li>• Apply therapeutic dressings</li><li>• Refer to specialists as required eg stoma care</li></ul>

#### **Skill 5: MANAGEMENT OF THERMOREGULATION**

<b>Neonatal Nurse QIS – performance criteria</b>
<ul style="list-style-type: none"><li>• Assess neonatal body temperature using appropriate method and site</li><li>• Monitor central and peripheral temperature gap</li></ul>
<ul style="list-style-type: none"><li>• Anticipate the baby at risk of temperature deviations</li><li>• Intervene to prevent temperature deviations</li><li>• Implement strategies to correct temperature deviations</li></ul>

## Knowledge 4 & 5: THERMOREGULATION, SKIN, HYGIENE AND INFECTION PREVENTION

<b>Anatomy and physiology (structure, function &amp; process) Normal newborn and convalescing infant</b>	<b>Practice knowledge</b>
<p><i>Anatomy, physiology &amp; functioning of the skin;</i> Structure of the skin Role of the skin in infection prevention, thermoregulation, fluid balance</p> <p><i>Thermoregulation</i> 4 Methods of heat loss; routes eg skin, respiratory, TEWL Internal and external heat gradients Heat conservation Heat production (Non Shivering Thermogenesis)</p> <p><i>Immune response &amp; infection:</i> Newborn immunity (Passive &amp; active) Risks associated with infection; congenital infections</p>	<p>Management of the environment; Normal thermoneutral environment Methods of reducing heat loss Prevention of thermal stress Delivery room management Prevention of overheating (in relation to Sudden Infant Death Syndrome and neurological outcome) Temperature monitoring strategies</p> <p>Infection prevention/control strategies Identification of antenatal risk factors for sepsis</p> <p>Routes of Transmission – eg vectors, nosocomial infection &amp; transmission</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Altered anatomy and physiology</b>	<b>Practice knowledge</b>
<p><i>IUGR, prematurity, underdevelopment:</i>  <i>Thermoregulation:</i>            Effects of low birthweight, differing gestational ages                Surface area:body wt ratio; subcutaneous fat stores;                vasoconstriction; posture; Brown adipose tissue stores; energy &amp;                O2 in heat production; CNS response            Hypothermia – effects on other systems (glucose use &amp; growth, oxygen use &amp; respiratory compromise, energy triangle)            Hyperthermia - causes</p> <p>Implications of skin immaturity            Factors which threaten skin integrity</p> <p><i>Infection</i>            Susceptibility to infection;            Increased susceptibility to infection in IUGR and prematurity            Physiological signs of infection</p>	<p>Strategies available to provide external heat source – eg Incubators vs radiant warmers/ servo control systems; advantages &amp; disadvantages</p> <p>Relevance of reducing TEWL &amp; respiratory heat loss in maintaining thermoneutrality.            Use of ambient humidification            Monitoring and significance of toe/core differentials</p> <p>Tools for measuring skin integrity            Planning care to minimise risk of skin damage or interventions when skin is breached eg extravasation injuries</p> <p>Local and systemic signs of infection.</p>

<b>Anatomy and physiology (structure, function &amp; process)</b> <b>Pathophysiology</b>	<b>Practice knowledge</b>
<p><b>Pathophysiology</b></p> <p>Consequences of cold stress &amp; cold injury (eg peripheral &amp; pulmonary vasoconstriction; hypoxia &amp; acidosis; reduced cardiac output/cerebral blood flow; apnoea; renal function)</p> <p>Sepsis – types &amp; timing (early/late onset infection); risk factors; septic shock</p>	<p>Delivery room management of infants with increased susceptibility to heat loss and infants at risk of neurological injury</p> <p>Monitoring of infants at risk of thermal stress</p> <p>Monitoring and management of infant with suspected or proven septicaemia</p> <p>Principles of therapeutic hypothermia monitoring/ management of shivering/ rewarming</p>

## Skill 6: MANAGING AND SUPPORTING THE FAMILY

<b>Neonatal Nurse QIS – performance criteria</b>
<ul style="list-style-type: none"> <li>• Recognise the impact of the neonatal environment on family functioning</li> <li>• Recognise families' feelings of grief and loss</li> <li>• Assess the individual needs of the family</li> <li>• Identify the level of support needed by family members and agree the plan of care with the family and healthcare practitioners</li> <li>• Plan a strategy of integration of families' needs into care</li> <li>• Actively promote participation in care</li> <li>• Provide memory making for all families from admission</li> </ul>
<ul style="list-style-type: none"> <li>• Involve and support families in decisions surrounding care</li> <li>• Support practices which promote families spending time with their baby according to their individual circumstances.</li> <li>• Recognise the needs of siblings, grandparents and the extended family network</li> </ul>
<ul style="list-style-type: none"> <li>• Act as advocate for the baby and family</li> <li>• Work with the family and external agencies in relation to identified interventions required linked to Safeguarding of Children</li> </ul>
<ul style="list-style-type: none"> <li>• Identify specific ongoing needs of the family</li> <li>• Establish health promotion and education for the family in preparation for discharge/transfer</li> <li>• Employ strategies that reduce the impact of stress on the family</li> </ul>
<ul style="list-style-type: none"> <li>• Recognise and respect language, cultural and religious beliefs, and family composition</li> </ul>
<ul style="list-style-type: none"> <li>• Provide support mechanisms for the family following an emergency/incident</li> </ul>
<ul style="list-style-type: none"> <li>• Sensitively care for the family and baby with a life limiting condition with support and guidance from senior staff</li> <li>• Sensitively care for the dying baby and the parents with support and guidance from senior staff.</li> <li>• Plan in collaboration with the family the place of death of the baby</li> <li>• Seek support when the situation is outside the level of comfort and confidence</li> </ul>
<ul style="list-style-type: none"> <li>• Sensitively care for the baby who has died and the bereaved parents in accordance with local and national bereavement protocols with support and guidance from senior staff</li> <li>• Initiate ongoing support for the family through formal and informal networks including local and national charitable and government organisations</li> </ul>



## Knowledge 6: MANAGING AND SUPPORTING THE FAMILY

Knowledge
<b>Family dynamics and functioning</b>
<p>Models and frameworks for family assessment Family dynamics and family functioning The impact of past life experiences Vulnerability and threats to the family following admission Altered dynamics and family functioning during the neonatal journey Family nursing in neonatal care environments</p> <p>Theories of attachment and loss The experiences and feelings of families within neonatal care The impact of the neonatal environment on the family Signs and sources of stress</p> <p>Family strengths and approaches to problem solving Family coping mechanisms Individual family communication strategies</p>

## **Empowering the family**

The role of the family in infant development  
Strategies and interventions to support development of positive parent-infant relationships

Strategies to support family health  
Strategies that respond to the long term impact of admission  
The role of the extended family support network

Verbal and non-verbal communication strategies  
Strategies to reduce the impact of stress on the family

The processes involved in decision making for families within neonatal care  
The role of the nurse as advocate with the 'non-verbal' baby and the vulnerable family or the family in crisis  
Priorities and planning in preparation for discharge

The long term impact of admission on the family  
Strategies to reduce the long term impact of admission  
Support systems within and outside the hospital environment

## **Palliative care**

Legal and ethical aspects of end of life care and withdrawal of active treatment  
The role of the Hospice within palliative care  
Palliative care pathways

The stages of bereavement and loss  
The differing expectations of families during the care of their dying baby  
The family's involvement in symptom control and management for the dying baby

Respecting cultural diversity relating to attitudes and behaviours surrounding death  
Creating memories for all family members

Agencies supporting families following a bereavement  
Agencies supporting families following diagnosis of life limiting conditions

## SECTION 2: Evidence of achievement

Teaching and assessment of knowledge and practice occur in both the classroom and clinical settings. It is expected that formal assessment of theory and practice will take place within accredited modules and programmes of study, at equivalent to final year degree level, delivered by HEIs. The skills set details performance criteria and can be utilised for assessment of practical skills acquisition. Assessing the transfer of knowledge into the practice setting is more challenging and relies on clear guidance for students and mentors. The 'practice knowledge' tables provide a frame of reference for both mentors and students to enable in-depth discussions and rationalisation of practice decisions to take place.

Documenting this learning transfer is vital if a standard QIS qualification is to be transferable between different practice settings. Therefore a criteria for evidencing this achievement is detailed here. Portfolios of practice development are widely used and well evaluated for continuing education in nursing and can provide a documented measure of learning (eg Scholes et al, 2004; Jasper & Fulton, 2005; Ryan, 2011).

### Portfolios

With the aim of creating a standard which can be transferred between units, trusts and countries it is recommended that in designing portable documentary evidence a QIS achievement portfolio will contain:

- Record of success in completion of assessed neonatal theory/practice modules within an accredited, validated qualification, completed within HE Institutions, which encompass both knowledge and skills learning outcomes *across the range of care*.

- Assessed performance of skills *across the range of care*
  - Skills performance assessed by NMC mentor with post-registration specialised neonatal care qualification
  - Documentation showing progress of practice development within each skill from 'practice under direct supervision' to 'independent practice', signed and dated by mentor and student. The mentor should be assured through observation and questioning, that rationalisation of practice is articulated.
  - Signature of overall achievement by mentor
- Written evidence which demonstrates transfer of knowledge to practice. The quantity of evidence should be *representative* of a standard which shows clear links between theory and practice within each skill across the range of care. Crucial to all types of evidence is the illustration of development via learning through critical analysis.

Examples of types of evidence may include:

- Structured reflective account linked to a scenario
- Critical incident analysis
- Annotated bibliography linked to decision making model
- Analysis of learning from multi-disciplinary meetings or formal learning events
- Record of question and answer session detailing links to evidence based practice

(Further information relating to portfolio development for QIS nurses can be found at <http://hesas.glam.ac.uk/neonatal/portfoliodevelopment/>)

### SECTION 3: Key quality principles for education provision.

It is expected that programmes and modules of study leading to QIS status will be delivered and assessed through accredited education provision (DH/NHS, 2009; BAPM, 2010; NICE, 2010). In the majority of cases this will be within the quality framework of HEIs (via the Quality Assurance Agency), primarily those which are validated by the NMC to deliver pre-registration nursing and midwifery training programmes.

As programme delivery for specialised post-registration nurse education within HEIs is not mandated by professional regulators the principles governing quality nurse education are therefore presented here as a reference point and benchmark guide. Included in this are key standards that are used for auditing the quality of nurse education provision.

<p><b>NMC Standards for pre-registration nurse education (2010)</b></p>	<p><b>Standards:</b>  Safeguarding the public  Equality and diversity  Selection, admission, progression and completion  Support of students and educators  Structure, design and delivery of programmes  Practice learning opportunities  Assessment and outcomes  Resources  Quality assurance</p>
<p><b>Quality assurance agency (QAA) code of practice for the assurance of academic quality and standards in higher education*</b></p> <p><i>* Revised standards are expected to be implemented in September 2012 via the 'UK Quality Code for Higher education'</i></p>	<p><b>Codes of practice:</b>  Section 2: Collaborative provision and flexible and distributed learning (including e-learning) (2010), precepts A1-A28 and B1-B8  Section 4: External examining (2004)  Section 6: The assessment of students (2004), precepts 1-15  Section 7: Programme design, approval, monitoring and review (2006), precepts 1-10  Section 9: Work-based and placement learning (2007), precepts 1-8</p> <p><b>Guidelines for preparing programme specifications (2006)</b>  <b>Subject benchmark statement: healthcare programmes (2001)</b></p>

Full details of the criteria utilised for auditing quality within these standards can be found at:

- NMC (2010). Standards for pre-registration nurse education. Available at [www.nmc.org.uk](http://www.nmc.org.uk)
- QAA Code of practice for the assurance of academic quality and standards in higher education (the Code of practice). Available at [www.qaa.ac.uk](http://www.qaa.ac.uk)
- The UK Quality Code for Higher Education. *In press, publication due Dec 2011.*

In addition standards for advanced practice preparation have been published by the RCN (2010). These standards include principles from both the QAA and the NMC and are considered as applicable to provision of specialised neonatal nurse education. Details can be found within:

RCN (2010) *Advanced nurse practitioners: an RCN guide to the advanced nurse practitioner role, competences and programme accreditation. Section3: Revised standards for RCN accreditation of advanced nurse practitioner educational programmes.* Available at [www.rcn.org.uk](http://www.rcn.org.uk)

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