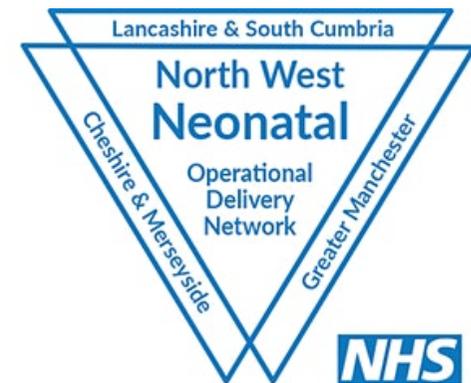


A Framework for Undergraduate Midwifery Neonatal Education in the North West of England to Support Neonatal Clinical Placement



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The Stakeholder Group were integral to the writing of this document, thank you to all those who contributed.

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Forward

This framework will support standardisation of education for pre-registration midwifery learners in neonatal care. It is vitally important that all midwifery students understand the challenges of newborn transition from in-utero to ex-utero life and gain the skills during their training to support this. It must, however, be recognised that pressure on neonatal services to support pre-registration students from midwifery and paediatric nursing and post registration students undertaking preceptorship and qualification in specialty are placing excessive pressure on neonatal services and their teams. This document supports the role of the Higher Education Institutes to provide the necessary knowledge for pre-registration midwifery learners through various learning styles, including simulation, meaning that the time spent on a neonatal clinical placement can then be focussed on embedding this knowledge into key areas. This framework should support HEIs in their approach to teaching and supporting all undergraduate midwifery learners across the North West in receiving standardised teaching. This is in line with the MORA and will aid to streamline the time spent in clinical placement by enhancing theory and focussed practical assessment.

The North West Neonatal Operational Delivery Network recommend the implementation of this framework and recognise the benefit of this approach to blending the theory and practice of neonatal care with clear aims and outcomes for pre-registration midwifery learners, HEIs and neonatal services. A reduction in variance in learning experience is necessary and the clear structure set out in this framework should be utilised to achieve this.

Kelly Harvey Senior Lead Nurse NWNODN

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Purpose

The aim of this document is to set out a gold standard of undergraduate midwifery learning in relation to neonatal care to ensure that placements in the neonatal clinical learning environment are standardised and optimised. Neonatal critical care is a key element of NHS maternity services and pre-registration education for midwives to underpin their understanding of challenges newborn infants face must be a priority. This document will offer structure and standardise the aims and objectives of neonatal teaching, suggesting which subjects should be included within undergraduate midwifery learning. It will guide how this information can be taught with recommendations of how education and clinical teams can work together. Recognition that all learners have different needs underpins this guidance. Alongside the topics included, are suggestions of how the blending of theory, clinical simulation and skills can complement targeted experiences in the neonatal clinical learning environment.

Introduction

This project was commissioned by the North West Perinatal team with funding from Health Education England following a piece of work completed by the North West Neonatal Operational Delivery network (NWNODN), which highlighted increasing pressure on neonatal services in supporting clinical placements for a variety of pre and post registration courses. Following welcome national investment in neonatal nursing workforce there is a significant increase in newly appointed nurses entering neonatal care, these staff require significant support through preceptorship and qualification in specialty resulting in an increase in learners in the system. The acknowledgement that neonatal clinical placements are limited but vital to all learners led to the need for further information gathering. This highlighted a disparity in time spent in neonatal units by undergraduate midwifery learners and emphasised a need for a more structured guidance for undergraduate neonatal education for midwifery learners in the North West. The aim is that time spent on neonatal environments will be utilised most constructively to consolidate theoretical learning.

Context and Background

This document will support the delivery of neonatal education to undergraduate midwifery learners within the North West of England. It was commenced following the recognition that exposure to neonatal learning and clinical experience was not consistent within the North West of England. Information gathered following a piece of work completed by the NWNODN highlighted that there is a variation in the time allocated to neonatal theoretical learning and clinical placement within neonatal environments for learners. Following a small project of information gathering, completed by the team which included the key stakeholders in NWNODN neonatal services, it became evident that clinical managers across all levels of neonatal care in the North West were unhappy with the current arrangement for undergraduate midwifery clinical placements. This was specifically related to the variations in length of time spent on

neonatal clinical learning environments and the structure of outcomes to be achieved. In parallel to the increase in learners within the neonatal setting following funding from the NHS Long Term Plan and recommendations from the Neonatal Critical Care review, there was an urgency to address this.

This document has been informed by both published literature and input from professional stakeholder collaboration. The data and information from the ATAIN work, NNAP and the Ockenden report (Ockenden 2022) evidence the need for change to enhance safety and respectful multidisciplinary working across professions. Influential drivers will both guide the document alongside the input from all stakeholders who have been included from the outset. The NMC midwifery proficiencies (NMC 2019) have been considered to ensure that the guidance is sustainable and maximises achievement of the midwifery proficiencies.

Undergraduate midwifery education is currently provided by eight higher education providers in the North West of England, all of whom were invited to contribute to the content of this document. At the time of writing, it was recognised that higher education institutions in the North West were at varied points in curriculum development following the publication of the NMC midwifery proficiencies (2019) therefore the document has been developed to support both current and future education. The time within undergraduate education curriculums when neonatal education is provided was considered as it was recognised by the team that this may impact the full potential of the neonatal clinical exposure. As curriculums are currently changing in line with the NMC standards this should be a consideration for all higher education providers for the future.

The need to reduce the number of babies that are admitted onto neonatal units has long been acknowledged as there is overwhelming evidence that separation of mother and baby so soon following birth interrupts the normal bonding process. This may have profound and lasting effects on maternal mental health, breastfeeding and the long-term morbidity for mother and child. The aim of the Maternity and Neonatal Safety Improvement Programme is to support improvement in the quality and safety of maternity and neonatal units across England. There are five areas of focus for this programme two, of which relate to neonatal care:

- Optimisation and stabilisation of the very preterm infant
- Detection and management of neonatal hypoglycaemia

The NMC Midwifery proficiencies have embedded the care of the newborn throughout, and the Newborn Infant Physical Examination (NIPE) will be included into all new midwifery curriculums moving forward. This will undoubtedly increase exposure to neonatal education and support the link across the care continuum. The Midwifery Ongoing Record of Achievement (MORA) has been produced to offer flexibility for newborn outcomes to be achieved in a variety of settings not just the neonatal unit, offering a more diverse approach to learning.

In September 2020 the NWNODN surveyed all neonatal nurse managers in the North West of England to understand the impact of the potential increase in the number of Midwifery Students requiring neonatal placements as part of the national “Maternity Expansion Programme”. This survey highlighted the variance in neonatal placements across the network, particularly in relation to placement length, which ranged from 1-6 weeks. In addition to the above the

nurse managers described the fact that there are an increasing number of staff groups, both pre and post registration learners who would be requiring neonatal placements. This was in addition to the development needs of their own neonatal teams. While it was noted that the managers understand the value of all learners having exposure to all aspects of neonatal care, it can bring added pressure to the unit teams which in effect could result in a suboptimal learning experience for midwife learners. In April 2022, the Neonatal Critical Care Review (NCCR) nurse staffing funding allocation was increased to recruit an additional 90-100 nurses new to neonatal care across the North West, which increased the urgency for the need for neonatal placements to be analysed. During the survey there was an opportunity for nurse managers to consider how undergraduate midwifery learners could be supported differently, to ensure that future midwives are educationally equipped to care for neonates who are at risk. It was articulated that there should be standardisation of the baseline knowledge required for midwifery learners. The feedback evidenced that some believed that a more structured approach was required to streamline the learning and utilise the neonatal clinical placement time better.

To understand the needs of undergraduate midwifery learners a survey was sent out by two Neonatal lecturers working in different universities in the North West. This was sent out via email to two different cohorts of 3rd year midwifery learners. The purpose was to capture information related to their experience of clinical neonatal exposure and theoretical learning. The results of this survey demonstrated that undergraduate midwifery learners acknowledged that they had a positive exposure to neonatal care and a variety of educational topics were taught within their educational program. The response was small therefore is only a snapshot of experience.

The main learning points from this information was that there remains a diversity of both theoretical learning and clinical exposure for undergraduate midwifery learners. This suggests that knowledge and education is not consistent, leading to a varied ability to recognise and manage the compromised and at risk of compromise neonate. The ability to recognise, measure using available tools such as NEWTS, escalate and manage a neonate at risk of deterioration and risk of collapse through varied causes such as an underlying cardiac condition or infection is imperative for all midwives.

This document will assist both higher education institutions and clinical educators in midwifery and neonatal environments to structure the learning required. It will help to guide the undergraduate midwifery learner to achieve the optimal educational experience when on placement in a neonatal environment. By equipping future midwives with this knowledge will help to reduce separation of mothers and neonates.

Considerations

It was highlighted early in the project that the recognition between NMC midwifery requirements for undergraduate midwifery learners is distinct in that clinical skills or simulation within a Higher Education Environment (HEI) cannot replace the required clinical hours set by the Nursing Midwifery Council (NMC). Therefore, it was recognised that the importance of neonatal clinical exposure in some format must be placed at the forefront of this document. The unique clinical hours directive differs from nursing where it can and is becoming increasingly common to substitute clinical placement hours in simulation environments to meet the needs of the increased numbers of learners.

In addition, there is an inconsistency of available simulation and skills related equipment within the HEIs. Some have exceptional resources whilst others do not, it was deemed that appropriate resources to accommodate skills learning within a HEI should be available. This was considered and a recommendation has been threaded throughout, related to the equipment that should be considered a priority for education providers to optimise simulation opportunities.

The modes of teaching the key topics that have been highlighted, have opportunity for growth and are not prescriptively guided. This document will offer a gold standard of areas for neonatal education that will enable future midwives to not only manage the compromised newborn but recognise those at risk of compromise. It is suggested that this exposure be through a variety of learning opportunities which will include a variety of theoretical learning strategies including a didactic approach to teaching, problem solving, blended learning and guided study. Skills and simulation learning both in the HEIs environment but also within the clinical areas will be suggested. All of which will be consolidated during the allocated time spent on a neonatal clinical environment. The use of a specific learning portfolio was discussed at stakeholder meetings however it is out of the remit of this project, it is however acknowledged that would offer a structure to support the proficiencies within the MORA and therefore may be a consideration for the future.

How Theory and Practice Align

Safazadeh et al (2018) found in their study that nurses and midwives face several challenges in implementing theory into practice. They and others claim that this stems from the learner viewing the university as an academic environment and the hospital as a clinical educational environment, and that the two are separate. This silo the two learning environments rather than linking them to work together. Embedding a structured approach to skills and role play learning with the aim to build upon this experience can enable a closure of the practice theory gap.

The current approach to the length of neonatal exposure is diverse and inconsistent. From meetings with stakeholders and a review of current time allocated it was evident that the majority of HEIs within the North West plan to offer a period of two full-time weeks or 70 hours. This is currently viewed by the stakeholder group as an appropriate timeline for a neonatal clinical placement, this was consulted locally during the focus group, however, may require a more national discussion. All neonatal outcomes stated within the MORA can be achieved in other placement settings such as post-natal wards, the community or transitional care therefore, it is imperative that this short timeline spent in a neonatal setting should be optimised to consolidate prior learning. It must be noted that the timing of neonatal teaching within the undergraduate midwifery curriculum must be considered to support clinical exposure. To facilitate the learning embedded within this document a period of two weeks placement within a neonatal specific area is recommended. If skills simulation is married with theoretical teaching within the HEI, this offers a more structured use of the neonatal placement time. This time should be used to consolidate learning through observation, supervisor discussion and practical experience.

The Family

The care of the family is integral to all areas of neonatal care and therefore should be threaded throughout all teaching. Family-Centred Care as a paradigm, care model, philosophy, or theory, has been considered by healthcare professionals within both midwifery and neonatal care. The more recent implementation of family integrated care within neonatal communities should be acknowledged and introduced into theoretical teaching. There are opportunities for this philosophy of care to be supportive of all areas of undergraduate midwifery learning. The needs of the family links to all topics listed within this document and it should be placed as a priority when any theoretical or simulation education is being provided. Listening to the needs of families and involving them in planning of care is paramount in any setting specifically within the area of maternity and neonatal care. This should be the foundation for all theoretical teaching of any subject matter and be integrated within any simulation provided. Undergraduate midwifery learners should be made aware of support networks available for families who experience neonatal care, specifically the charity Bliss. Involving the family and providing support and advice to parents is integral to the delivery of high-quality care and undergraduate midwifery learners should be equipped with the ability to provide this. Parents are not bystanders in the care of their newborn and play an active role providing care and support. To perform this role teams, need to understand how support can be provided and family integrated care facilitated; this was one of the key actions in the Neonatal Critical Care Transformation Review. There are various models of care that can support parents in this way with the NWNODN approaching Fi Care as a network to reduce variation for families, knowledge of this philosophy of care and network wide approach should feature within all learning.

Newborn Nutrition

Newborn nutrition is an important area and will thread throughout all neonatal topics taught within the undergraduate programme. Most placement facilities within the North West are Unicef baby friendly accredited and therefore should have in place systems to support breast feeding and the provision of human milk. As a region the North West are extremely lucky to have a human milk bank which is accessible to all neonatal units. Nutrition has not been isolated as one topic within this document as it links with every topic that is described and therefore should be part of both the theoretical underpinning and any simulation or clinical consolidation. There are many professionals both within maternity teams and neonatal teams including Allied Health Professionals (AHPs) who can offer additional education and support to help learners to recognise how they can both impact and support neonatal nutrition. It is imperative that learners become familiar with national directives and local guidance in relation to nutritional management. Skills such as orogastric and nasogastric tube insertion and feeding should be part of skills teaching.

Inclusion and Cultural Awareness

There has rightly been a drive to decolonise teaching within all educational institutions and ensure that education teams have a better understanding of the needs of all populations within our society. It is imperative that this document and all education that transpires because of it are representative of all populations within our society. It is important that both educationalists and healthcare practitioners recognise that the traditional roles of parents are changing and by using inclusive language and pictures is a key part of creating a respectful environment for parents who identify as LGBTQ. More cultures and ethnicities are accessing healthcare and it is well documented that Black, Asian and minority ethnic (BAME) communities have in the past faced inequality when accessing healthcare services. This must be acknowledged, and learners should be educated to understand how this can be overcome. The acknowledgement of different skin tones specifically when teaching topics such as jaundice should be considered, and the use of simulation dolls should not only represent white skin colour.

Wellbeing

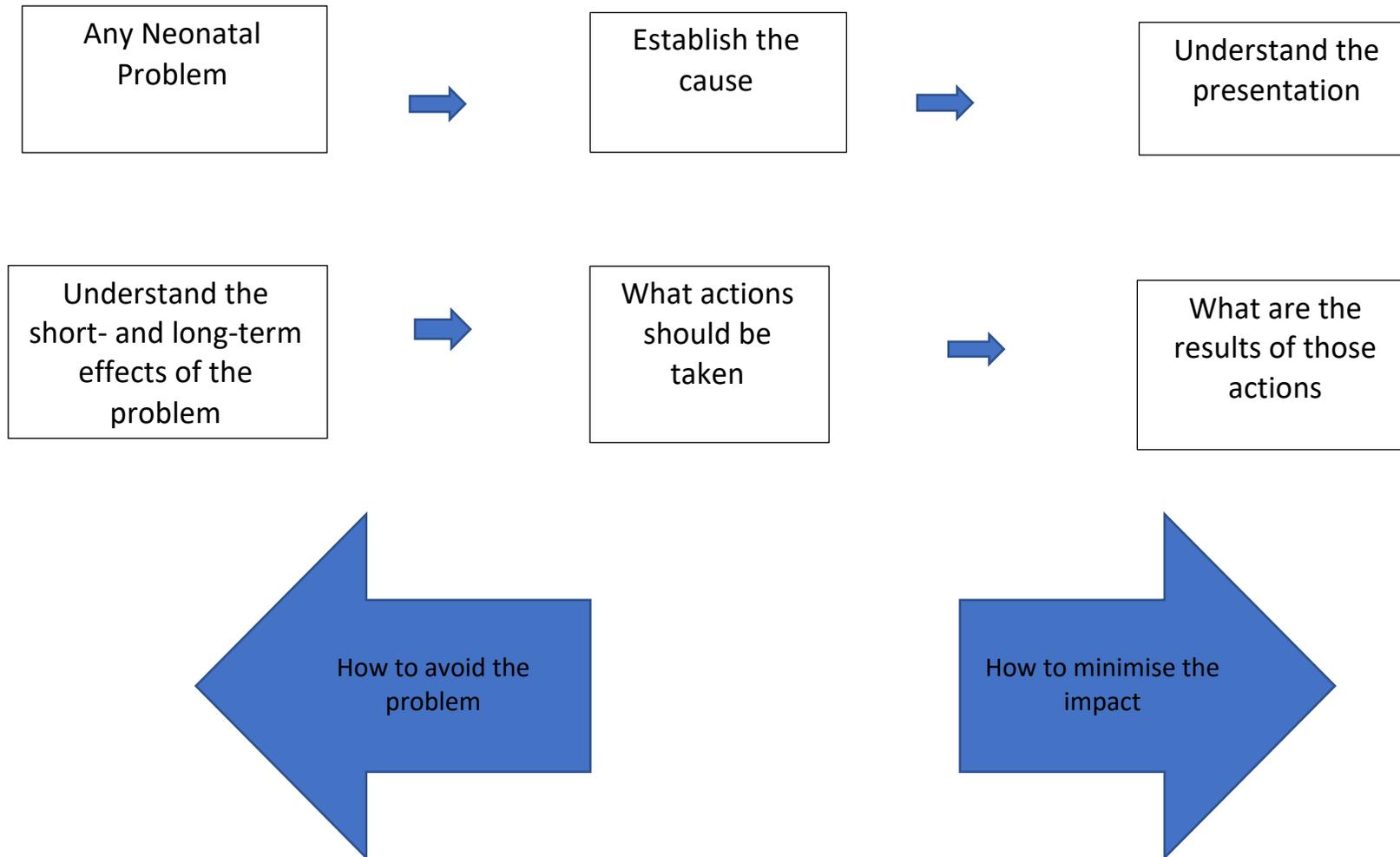
Recognising staff wellbeing supports the team to have the ability to cope with and adapt to new situations. As healthcare is an ever-changing environment with new and complex situations and challenges, it is imperative that we recognise that healthcare professionals of the future require the skills to support their own mental health and wellbeing. Due to a multitude of factors such as demands within the workplace, staff turnover and advances in medical research and technology it is important to recognise the impact of this on the team, specifically on learners. Adding learning about resilience and wellbeing into the curriculum will not only support learners to recognise the importance of this but will also equip them with skills to support families. A report from the Health and Social Care Select Committee noted the concerns related to high levels of burnout among healthcare workers. It explained that this is due to the stresses of the COVID-19 pandemic and other factors. Enabling learners to build resilience and recognise what can support them to healthier mental health has the potential to build a healthier workforce for the future.

Standardised Neonatal Topics

This section will guide the reader to the areas of neonatal specific topics which should be taught to all undergraduate midwifery learners. It will offer a suggestion how they can be taught and suggest a linked approach to support consolidation of learning in clinical placement. By encouraging learners to approach all new information in a way that links theory to practice can support the development of clinical skills. By setting this into a format that offers a structured approach will reduce the need for long neonatal placement and utilise the time spent in this area more productively. Theory and skills simulation linked to all areas of learning prior to attending clinical placement will offer the opportunity apply understanding to the relationship between both conditions

and management to better equip midwives to manage not only the compromised newborn but the newborn at risk of compromise. In order to utilise all areas of learning opportunity and encourage learners to fully immerse themselves in the knowledge it is vital to offer a consistent approach to care therefore, the below flow diagram will be used for each topic area to support the clinical teams to have structure to offer teaching and clinical consolidation related to key areas of neonatal support. This will assist to support the link between theoretical teaching and practice. This diagram offers a foundation for teaching all neonatal topics and conditions, this will support the learner to have a recognition of not only their underpinning knowledge but also their actions for management and prevention.

This diagram offers a foundation for teaching all neonatal topics and conditions, this will support the learner to have a recognition of not only their underpinning knowledge but also their actions for management and prevention.



Equipment

There are many areas where equipment is integral to neonatal care therefore, this has been threaded throughout this document. It is acknowledged that not all universities will have access to equipment to offer simulation learning however recommendations have been made to aspire to a gold standard. All areas of learning should be used to access neonatal knowledge which includes skills teaching and simulation, which requires the use of a variety of equipment. It is recommended that competency using any equipment should be assessed, and no learner should be checking or documenting checks of any equipment without a full understanding of how it works, how to set alarms and safety levels and how to troubleshoot.

Below is a list of equipment that may be accessed by the midwifery learner during the care of any neonate either on maternity areas or in the neonatal unit. This list is not exhaustive and relates to the midwifery learner only.

- Resuscitation platforms
- Saturation monitors
- Oxygen blenders
- Oxygen analysers
- Thermometers
- Bilirubinometers
- Blood pressure machines
- Blood glucose monitors
- Phototherapy equipment
- Radiant warmers
- Blood glucose monitors

Core learning

	Core Theoretical Learning	Simulation skills learning Gold Standard	Consolidation of learning in neonatal clinical area
Intended Recipients	All undergraduate midwifery learners	All undergraduate midwifery learners	All undergraduate midwifery learners
Topics currently taught to undergraduate learners	Hypoglycaemia Thermoregulation Growth restriction Infection Bonding & Attachment Neonatal Jaundice	NLS Positioning and attachment	Some workbooks are utilised with skills signed off by midwifery assessor.
	Additional Areas of Learning that should be included	How Could this be taught	Clinical Consolidation
Additional topics that should be included and how they could be facilitated	Newborn observations and documentation Escalation – Communicating neonatal concerns. Resilience/ Wellbeing Newborn medication management- antibiotic administration Newborn equipment – Saturation monitors, resuscitaire, phototherapy equipment, infant warmers etc Newborn blood sampling Hypoglycaemia management Bonding & attachment/ perinatal mental health Fi Care / Neonatal families Perinatal Mental Health	Theory-Role play Theory- simulation- Group work/ seminars Theory/ safe medicate Simulation – link with NLS Theory – Skills Theory – Skills simulation/ case study seminars Theory/ observation/case studies Theory / case studies/ simulation	Observation in placement Placement outcomes Placement outcomes Placement Consolidation of learning Observation and clinical outcomes Consolidate learning in all midwifery areas Consolidate in all areas Neonatal placement outcomes

How this guidance works

Each core topic in this guidance follows the following structure, allowing for individualisation into each HEI's curricula to account for its place within the curriculum and links to other related topics.

- Rationale for learning
- Theoretical and clinical learning opportunities
- Recommended equipment for HEI simulation
- Theoretical and competency-based clinical learning

Core Learning Topics

Newborn Observations

One of the first areas of assessment in any situation is to measure clinical observations, therefore this is a skill that should be taught to all undergraduate midwifery learners. It is the purposeful gathering of information to inform clinical decision making to support escalation and care provision. The gathering of newborn observations involves the use of key pieces of equipment therefore in addition to an understanding of newborn pathophysiology, equipment competence is also required.

Links to neonatal observations will continue throughout the document as they link to the physiological conditions that a neonate can present with at delivery and during post-natal care.

When referring to neonatal observations this will include observation of general appearance, monitoring, respiration monitoring, auscultating the heart rate using a stethoscope and the placement of a saturation probe to measure oxygen saturations. As ECG monitoring is now being incorporated into neonatal resuscitation then this is also an important area for midwives to be skilled.

All neonates in acute hospital settings must have regular comprehensive physiological observations in line with maternal and neonatal guidelines. The identification of neonatal abnormal observations or those neonates causing concern must be followed by a prompt and appropriate level of escalation to the neonatal team. This is often measured by using a tool such as NEWTT, it is important that midwives understand which neonates meet the criteria for the commencement of regular observations and they have the skills to clearly document why the observations are being carried out and the duration they are to be carried out for. To achieve the learning specified it is advisable that monitoring equipment is made available within educational skills labs.

This section links to the MORA: **N6 (all proficiencies)**

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the use of equipment.
- The consolidation of this learning can then be applied to the clinical setting whilst in the clinical learning environment under the supervision of practice supervisors on delivery suite, transitional care, postnatal units, and neonatal placement areas

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Thermometers

Blood pressure/ saturation monitors

Simulation dolls

Neonatal Observations

In order to recognise the newborn at risk of compromise it is vital to fully understand newborn pathophysiology and the theory behind newborn observations and how to correctly obtain this information.

Normal observation levels

This should be taught in a theoretical session by academic teams

A competency for the use of all equipment used in practice should be completed on clinical placement

Consolidating learning

Opportunity for skills to be consolidated should be available within the HEI and in practice and linked to the MORA

Role play/ simulation opportunities to link these skills with newborn escalation tools

All further topic areas should include an aspect of newborn observations to link this skill development

Escalation, Communication & Documentation

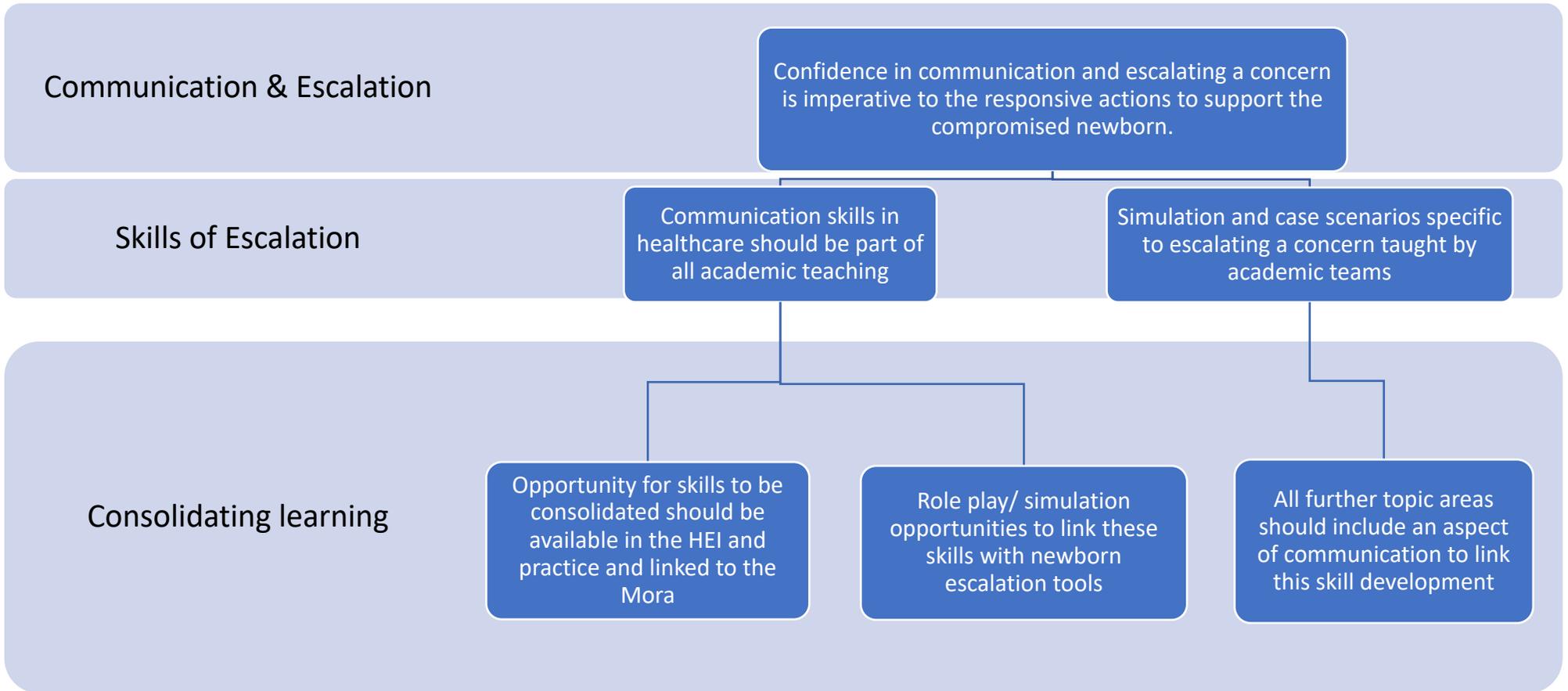
Care escalation for the neonate at risk of deterioration is vital to the responsive approach and requires that midwives are able to effectively communicate patient concerns to more senior team members specifically, the neonatal medical team. However, multiple factors can inhibit professionals from escalating their concerns. This can contribute to treatment delays and sentinel events. Therefore, escalation and communication are important parts of undergraduate midwifery learning and linking these specifically to neonatal concerns can advocate a responsive approach. The skills of communication are vital to all parts of healthcare and often taught within undergraduate programmes. Linking this teaching with the skill of escalating a patient concern is not always routinely embedded into the curriculum. By offering this teaching in a theoretical session supported by simulation skills learning prior to attendance on neonatal placement can offer a more efficient approach to clinical exposure. Advanced neonatal nurse practitioners are ideal clinicians to support this area of learning if spoke placements are available or they are part of the education teams supporting HEI learning. Documentation is a consistent thread throughout undergraduate midwifery learning however neonatal specific documentation must also be included. This would be related to competently documenting clinical observations, serum bilirubin results and other blood results and all areas of neonatal documentation.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of escalation.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement areas.

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Thermometers
Blood pressure/ saturation monitors
Sim dolls
Resuscitation platform
Examples of documentation?

This section links to the MORA: **N4 (all proficiencies), & N5 (all proficiencies)**



Newborn Blood Sampling

The skill of obtaining a blood sample from the neonate is an important skill that the midwife should possess. This is often utilised in most occasions to obtain the newborn blood spot sample however, the skill is also required in other areas of care such as testing serum bilirubin levels and obtaining blood to monitor blood glucose. There are many aspects to consider when taking a newborn heel blood sample which will enable the practitioner to be successful and cause the least discomfort for the neonate which is why this has been included in this document.

The recognition of anatomy and the effects of temperature on vasoconstriction should be taught in a theoretical session. Understanding the use of equipment specific to gestational ages and sizes of the newborn heel is an important factor to understand and should be demonstrated in skills teaching. Pain management and involving the family are important areas to be included and should be present in all aspects of teaching. This learning can be consolidated when on placement in all areas of maternity care such as the delivery unit and postnatal wards as well as in the community setting. To achieve the learning specified the availability of blood glucose monitoring equipment within educational skills labs would be advised.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of newborn blood sampling.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement areas.

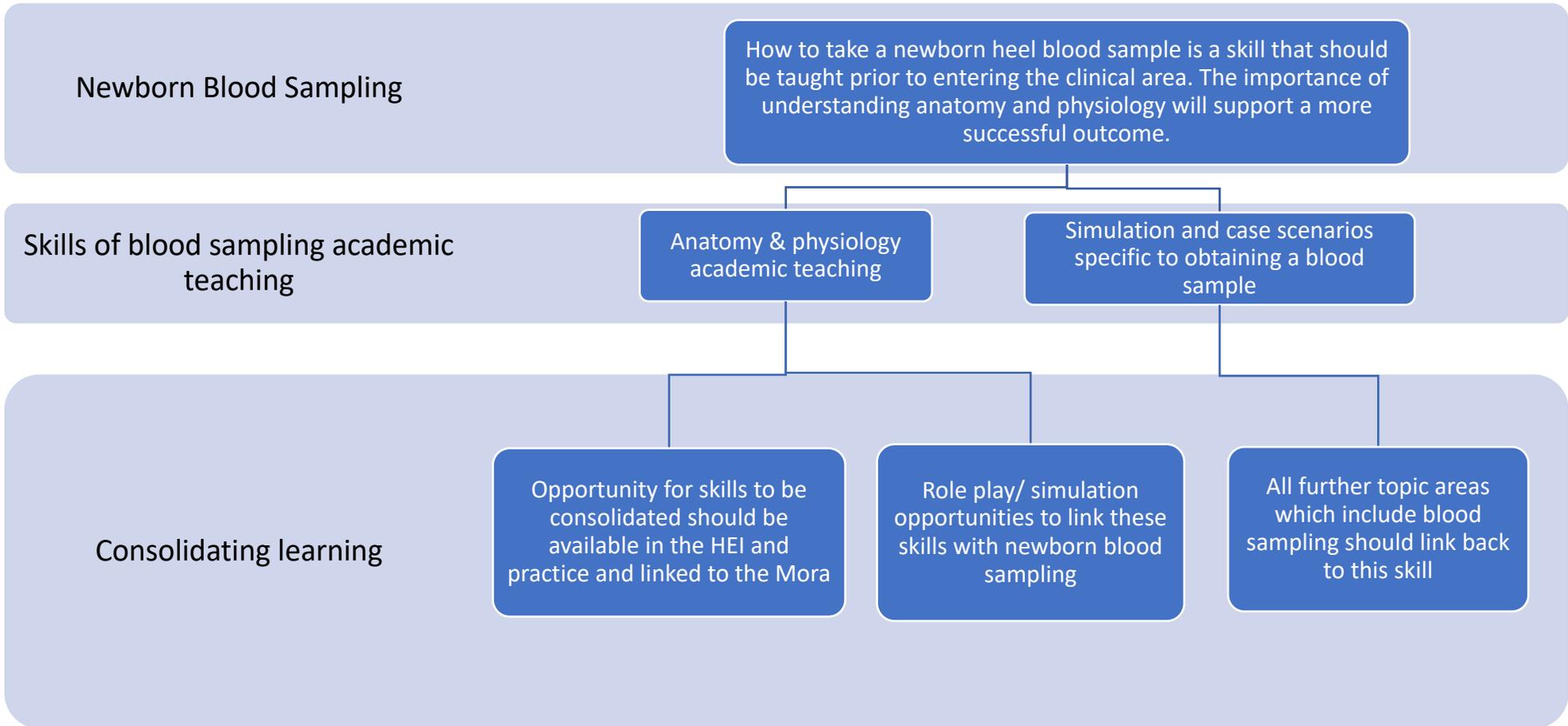
There are key areas that should be included within this teaching which can be achieved through theoretical teaching, project-based learning, and skills simulation these include:

- How to carry out a newborn blood sample
- Why the recognition of infection prevention should be a priority
- Why the recognition of pain management should be a priority

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim dolls
Blood glucose monitors
Heel lancets and simulation heels

This section links to the MORA: **N1.5, N1.6 & N6.4**



Thermoregulation

The impact of hypothermia or hyperthermia on the neonate can have profound impact and consequence and therefore, should be the basis for all neonatal education. It is stated in the UK resuscitation council guidance the importance of thermoregulation and mortality (UK Resuscitation Council 2021). To enable the learner to fully understand this impact and have the skills to monitor, escalate and manage the situation should be one of priority. Thermoregulation is the foundation for many other neonatal conditions and this link is a vital source of information to enable the learner to recognise signs of compromise and deterioration. The learner should have access to education around the underpinning physiology and how the energy triangle relates to thermoregulation. How to recognise any neonate that is at risk of compromise is a key learning outcome. This learning should include how to effectively monitor the neonate to aid diagnosis and what actions, or escalation is required. This would include the use of equipment to measure temperature.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of thermoregulation management.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- The factors that place a newborn at risk of hypothermia
- How to understand how to carry out newborn observations and what actions to take if there are deviations from the normal
- Why the recognition of hypothermia is important
- Links with the energy triangle
- The recognition of babies at risk of hypothermia such as the low-birth-weight baby or preterm baby to be able to recognise babies at risk
- How to carry out a physical examination
- Steps to prevent hypothermia in all newborns, especially those at risk of hypothermia
- Links to skin-to-skin contact and establishment of lactation/infant feeding

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby

Thermometer

Warming equipment if available

This links to the MORA: **IP 5.1, IP5.2, N1 (all proficiencies) & N6 (all proficiencies)**

Thermoregulation

How to take a newborn temperature is a skill that should be taught prior to entering the clinical area. The importance of understanding anatomy and physiology will support a more successful management plan.

Skills of managing hypothermia/ hyperthermia

Anatomy & physiology related to thermoregulation academic teaching

Simulation and case scenarios specific to managing a compromised newborn presenting with an abnormal temperature reading.

Consolidating learning

Opportunity for skills to be consolidated should be available in the HEI and practice and linked to the Mora

Role play/ simulation opportunities to link these skills with obtaining a newborn temperature and managing thermoregulation

All further topic areas which include any links to the energy triangle should link back to this skill

Hypoglycaemia & Hyperglycaemia

Hypoglycaemia continues to be one of the leading causes of term admission to neonatal units and therefore must be included within this document. In 2017 the British Association of Perinatal Medicine produced the framework for Identification and Management of Neonatal Hypoglycaemia in the Full-Term Infant. This was because of discrepancies in care provision resulting in the number of mother and baby separation continuing to rise. The understanding of hypoglycaemia and recognition of newborns who are at risk of compromise is a foundation for understanding many other complications that midwifery learners will encounter. If equipped with the knowledge and understanding to recognise and manage the newborn at risk of hypoglycaemia can result in the avoidance of admission to a neonatal unit. Learners must be aware of Trust guidelines that can support any newborn who is for any reason reluctant to feed, this may be because of disease or the impact of delivery.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the recognition and management of hypoglycaemia.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- The factors that place a newborn at risk of hypoglycaemia or hyperglycaemia
- How to understand how to carry out newborn observations and what actions to take if there are deviations from the normal that may lead to hypoglycaemia
- Why the recognition of hypoglycaemia should be a priority and links to the energy triangle
- Links with infant feeding and thermoregulation
- The recognition of babies at risk such as the infants of diabetic mothers or small for gestational age
- How to carry out a blood glucose blood sample

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby/ simulation newborn heels
Blood glucose testing equipment

This links to the MORA: P5 (all proficiencies), IP 5.3 & IP5.4, N6 (all proficiencies)

Hypoglycaemia/ Hyperglycaemia

How to recognise and support a newborn at risk or suffering from hypoglycaemia will aid a more successful management plan and avoid separation.

Skills of managing hypoglycaemia and hyperglycaemia

Anatomy & physiology related to blood glucose academic teaching

Simulation and case scenarios specific to managing a compromised newborn presenting with an abnormal blood glucose.

Consolidating learning

Opportunity for skills to be consolidated should be available in the HEI and practice and linked to the Mora

Role play/ simulation opportunities to link these skills with obtaining a newborn blood sample and acting on this result

All further topic areas which include any links to the energy triangle should link back to this skill

Infection

Enabling undergraduate midwifery learners to understand neonatal infection is a key area of education that will support care. Midwives are exposed to neonates suffering from infection and therefore must understand the physiological consequences of early and late onset infection. The causes of infection and the physiological impact on the neonate is a critical point of learning to formulate an understanding of the way in which the neonate will present. To competently manage infection, it is important that the student fully understands the pathophysiology related to the immune system. Risk factors for infection and signs and symptoms should be included in the underpinning theory.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the management of infection.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement.

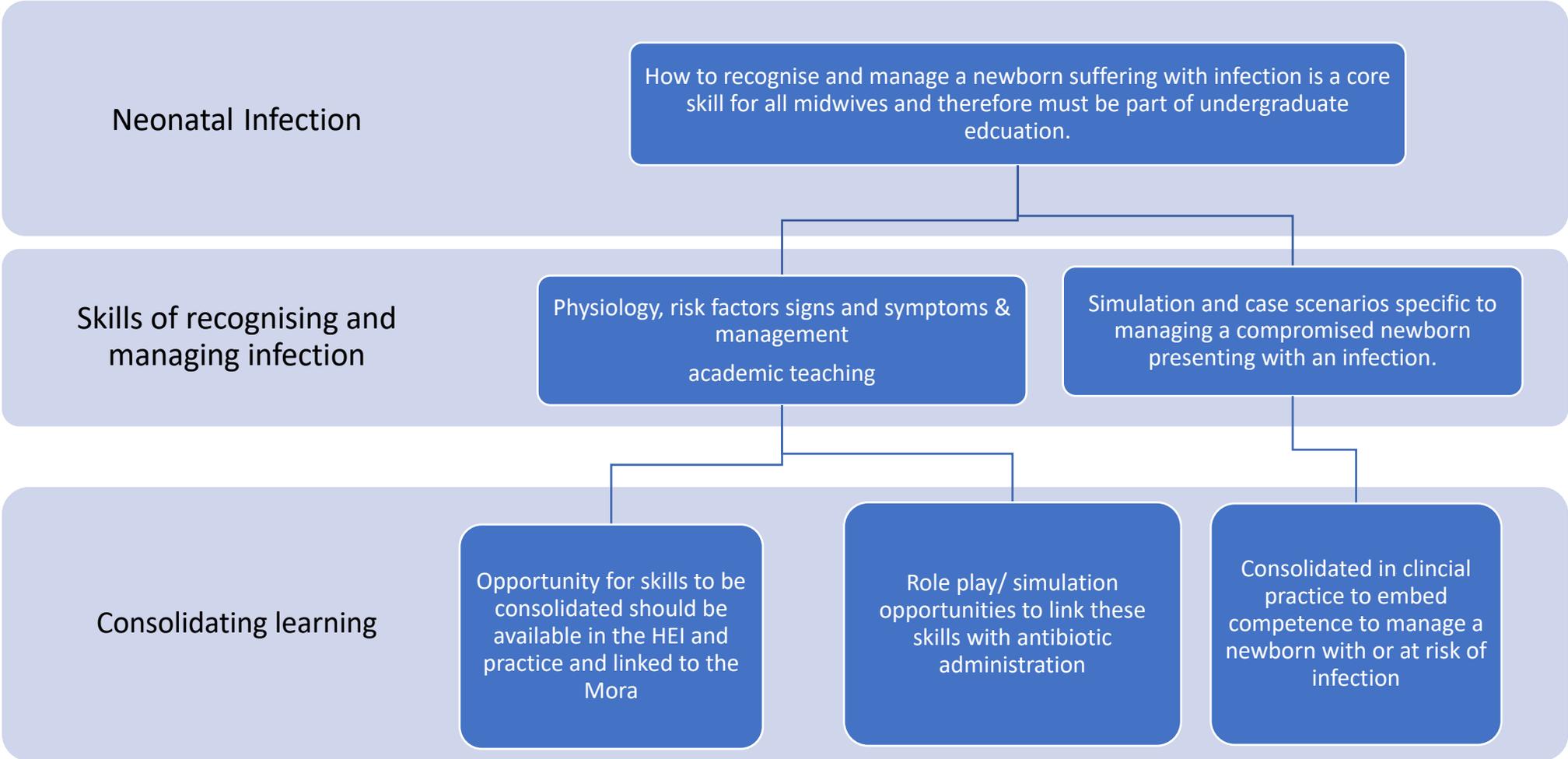
There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- The factors that place a newborn at risk of infection
- How to understand how to carry out newborn observations and what actions to take if there are deviations from the normal
- Why the recognition of infection should be a priority
- Links with medication management and antibiotic administration
- The recognition of babies at risk such as the mother presenting with infection
- How to carry out a physical examination

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby
Syringe drivers
Cannulation equipment to consolidate antibiotic administration exposure

This links to the MORA: N3 (all proficiencies), N6 (all proficiencies), but specifically N6.1, N6.2 and N6.3



Neonatal Jaundice

Neonatal jaundice (hyperbilirubinemia) is a common condition experienced by many newborns, therefore, must be included in the theoretical curriculum for undergraduate midwifery learners. A high blood level of bilirubin can place a newborn at risk, particularly in babies born before 38 weeks' gestation (preterm babies) and some breast-fed babies. The pathophysiology, risk factors, signs and symptoms and management are essential for the safe management of all babies. Learners must be taught how to correctly plot results and use treatment equipment. In a small number of cases neonatal jaundice can be the sign of an underlying condition, therefore an understanding of pathophysiology is integral to safe management and will aid recognition of concerns that require escalation to the medical teams.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of managing neonatal jaundice.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- The factors that influence the development of significant hyperbilirubinemia
- How to check the baby for jaundice and what actions to take if jaundice is present
- Why the recognition of jaundice in the first 24 hours should be a priority and requires urgent medical advice
- Links with infant feeding teaching and supporting
- The recognition of babies at risk such as a previous sibling with neonatal jaundice who required treatment
- How to carry out the physical examination such as checking the naked baby in bright and preferably natural light which includes examination of the sclerae, gums and blanched skin is useful across all skin tones.

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

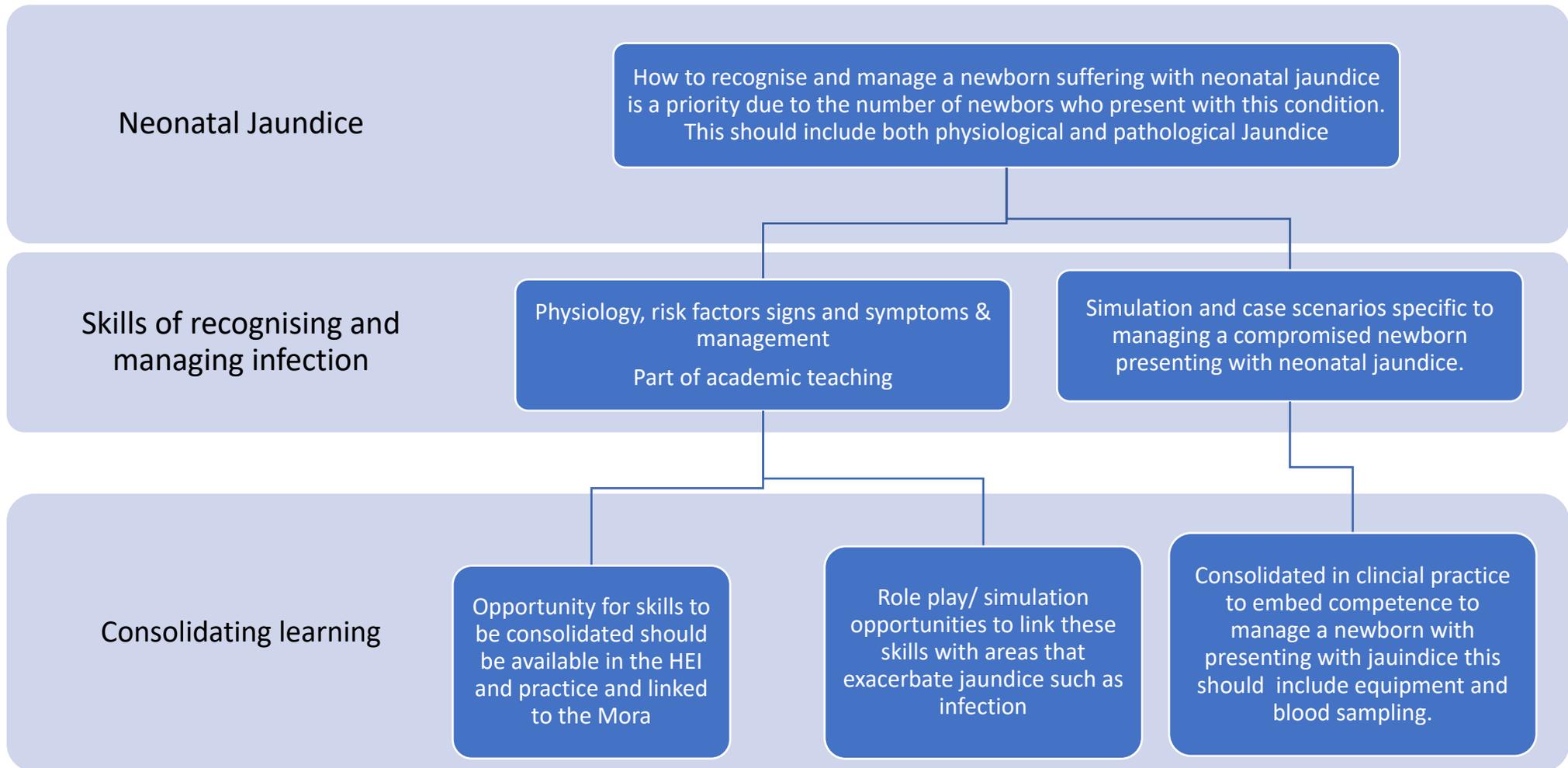
Sim baby

Phototherapy lamps or Bili-blankets

Eye protection

Serum Bilirubin level plotting charts for all gestations

This links to the MORA: P5 (all proficiencies), N1 (all proficiencies), particularly N1.2, N1.5, N1.6, N2 (all proficiencies) & N6.5



Respiratory Compromise

Respiratory distress can affect both term and preterm newborns and is increasingly common in even modest prematurity. Preventive and therapeutic measures for some of the most common underlying causes can reduce the burden of disease and therefore should be part of all midwifery undergraduate education. This should include embryology to support the understanding of anatomical compromise for some babies. The link to other areas of learning should be prevalent and reference to the sections related to infection and hypothermia are suggested. The ability to not only care for a newborn who has respiratory compromise but to recognise those at risk of compromise is important and should be articulated as a priority. Escalation is the responsive actions of the midwife and can enable treatment to be put in place therefore, this section links to escalation and communication.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of managing and escalation respiratory compromise.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment working with practice supervisors both on delivery suite, transitional care, postnatal units, and neonatal placement.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- The factors that influence the presentation of respiratory compromise
- How to assess the baby for respiratory compromise
- Why the recognition of respiratory compromise should be a priority and requires urgent medical advice
- Links with the energy triangle
- The recognition of babies at risk of respiratory compromise
- How to manage the immediate care and escalate to the medical team

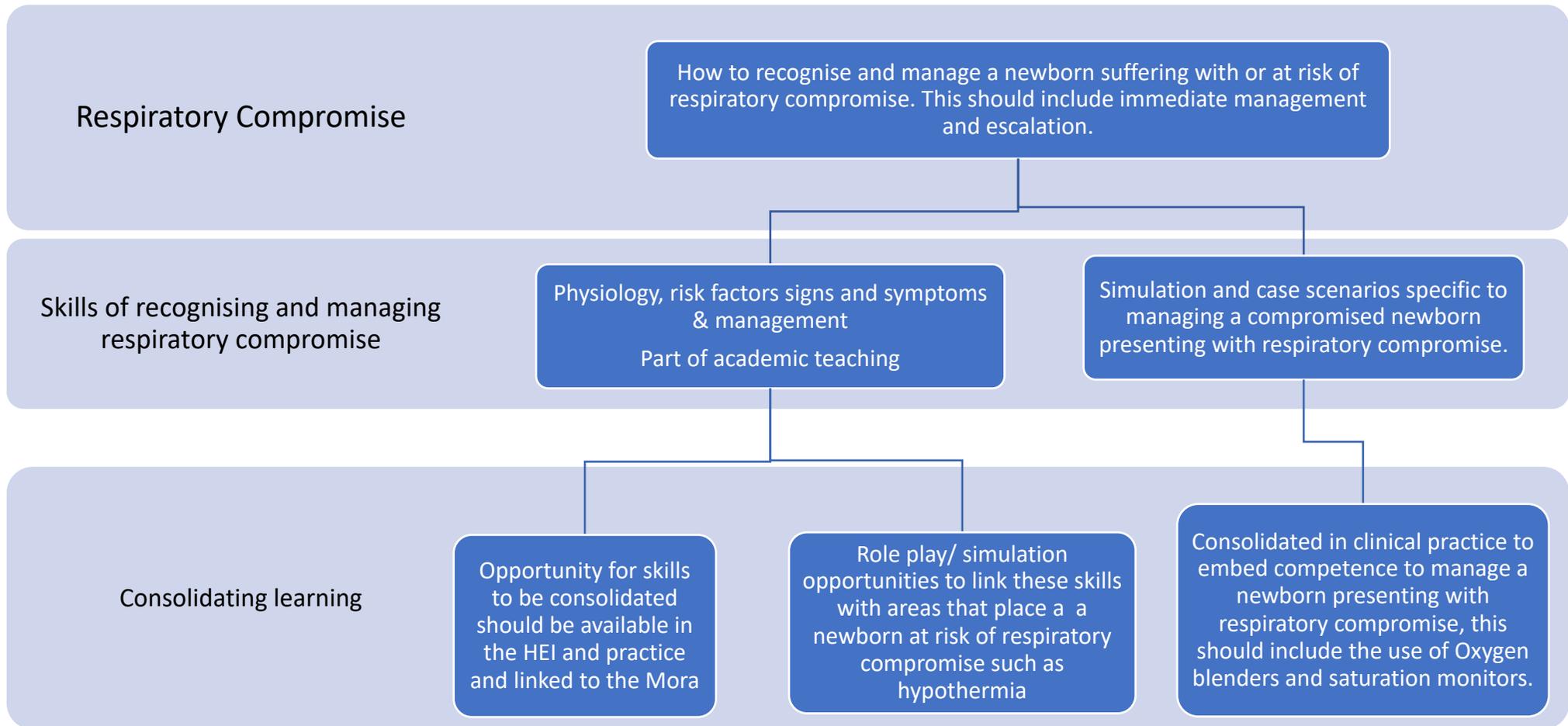
The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby

Monitoring equipment such a saturation monitor

Resuscitation platform

This links to the MORA: IP5.1 & N6 (all proficiencies)



Medication Administration and Management of IV Access

Transitional care facilities vary within Trusts, and this must be acknowledged within this guidance. With this consideration it is recognised that more preterm babies and babies requiring additional support are being cared for on post-natal wards. Many of these babies will require medication administration and this requires the midwife to understand how to care for newborns who have cannulas in situ. Midwifery learners at point of qualification should have the understanding how to administer prescribed neonatal medications specifically intravenous antibiotics, this competence would then be developed post qualification. Post graduate education and clinical exposure should include exposure to bolus intravenous administration of drugs and the use of syringe drivers. There should be opportunity to access E Learning such as Safe Medicate within undergraduate education.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of medication administration.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors on transitional care, postnatal units, and neonatal placement.

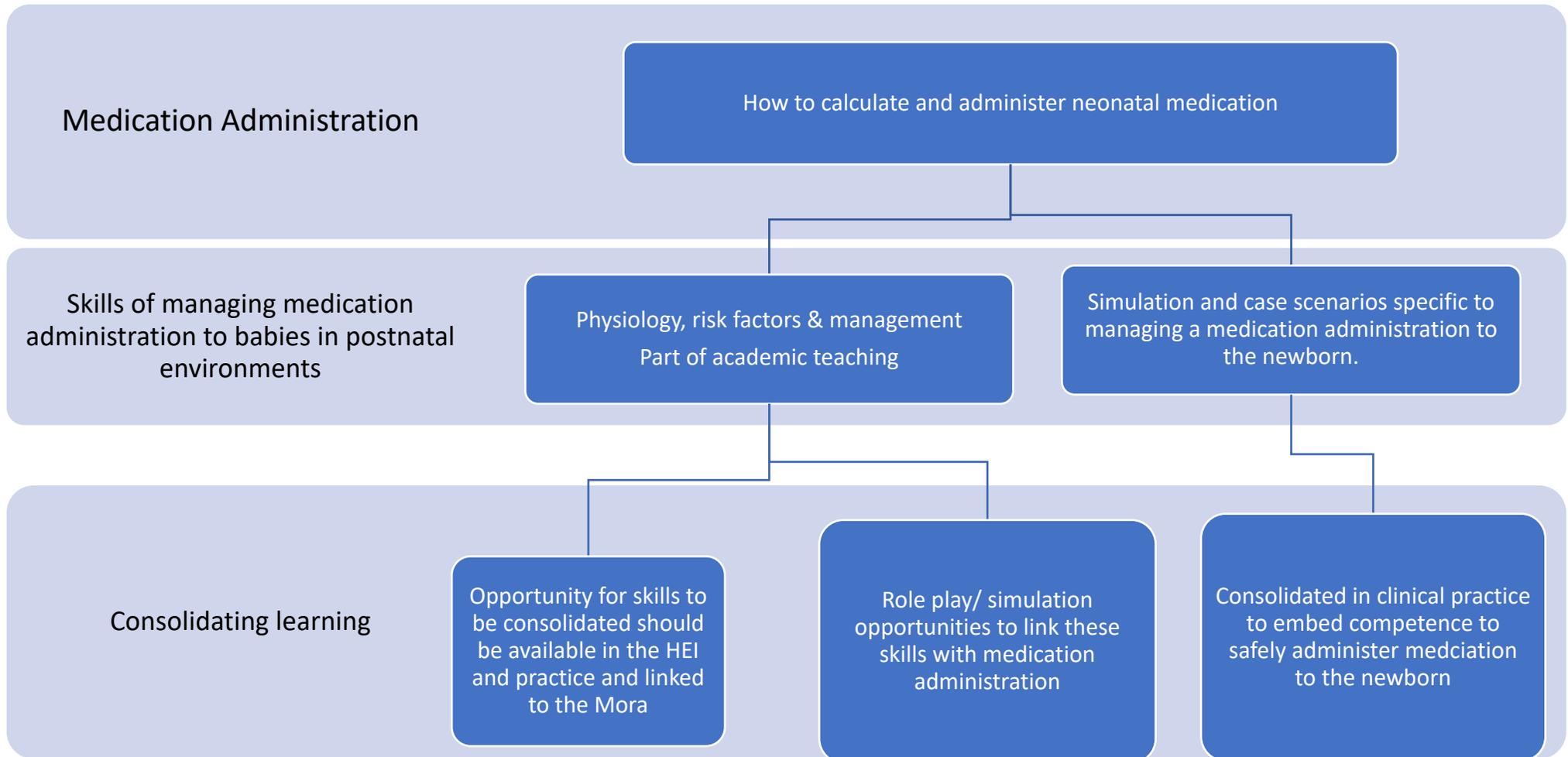
There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- Calculation of neonatal medications
- Links to infection and the underlying cause for medication administration
- The professional accountability related to medication administration
- Pharmacology related to common neonatal medications
- Cannula management and infection prevention
- The use of syringes drivers in neonatal situations

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby
Syringe driver

This links to the MORA: N3 (all proficiencies)



Newborn Resuscitation & Human Factors

Most infants adapt well to extra-uterine life however some require help with stabilisation, or resuscitation. Most babies will breathe spontaneously without any intervention however understanding the impact of drying, physical stimulation and airway opening manoeuvres are important skills for the undergraduate midwife learners to have. Although midwives do not require the more intense airway adjuncts, such as intubation, an understanding of the impact of this for the family is a beneficial skill. Human factors have been highlighted in the Ockenden report and has long been part of neonatal simulation however it is recognised that this is not always included in undergraduate midwifery learner education. This must become part of all simulation and specifically neonatal life support (NLS) training and education. The importance of role understanding escalation and immediate management is integral for sound NLS education. How, why, and when to check the equipment necessary for this skill should also be mandatory and learners must be educated to understand the relevance of equipment checking and their accountability. All this learning should be linked and follow the UK NLS resuscitation guidance (2021).

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios and the skills of NLS.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors on transitional care, postnatal units, and neonatal placement and the delivery unit.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- Recognition and understanding of the underlying pathophysiology
- Awareness of the NLS algorithm
- Understanding the equipment required and how to check it
- The professional accountability related to equipment checking
- Links to escalation and documentation
- Understanding the barriers to effective escalation and team working

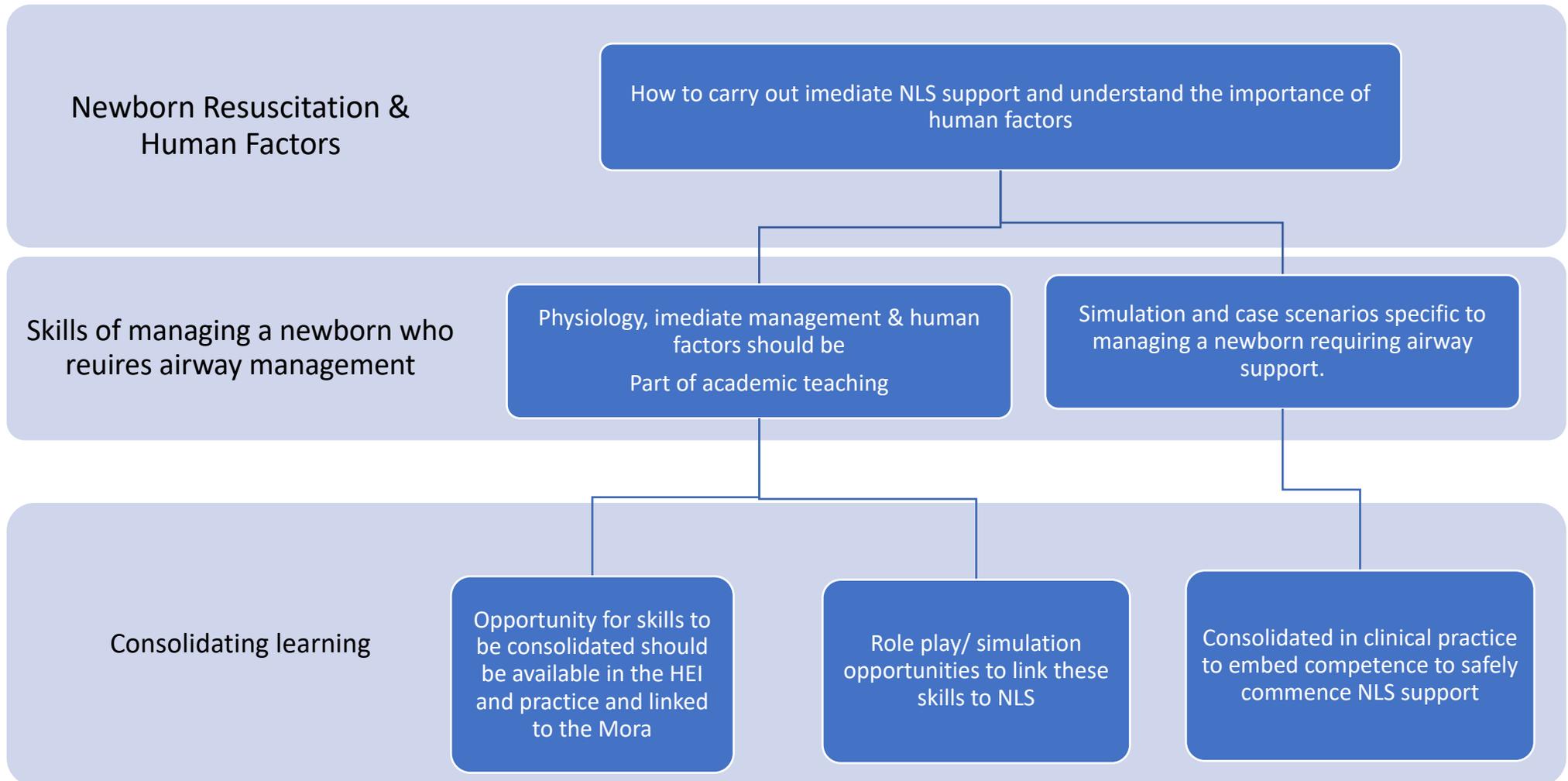
The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby/ Basic Life support baby mannequins

A Resuscitation platform

Laryngoscopes & Stethoscopes

This links to the MORA: IP5.1, IP9.1 & N5 (all proficiencies)



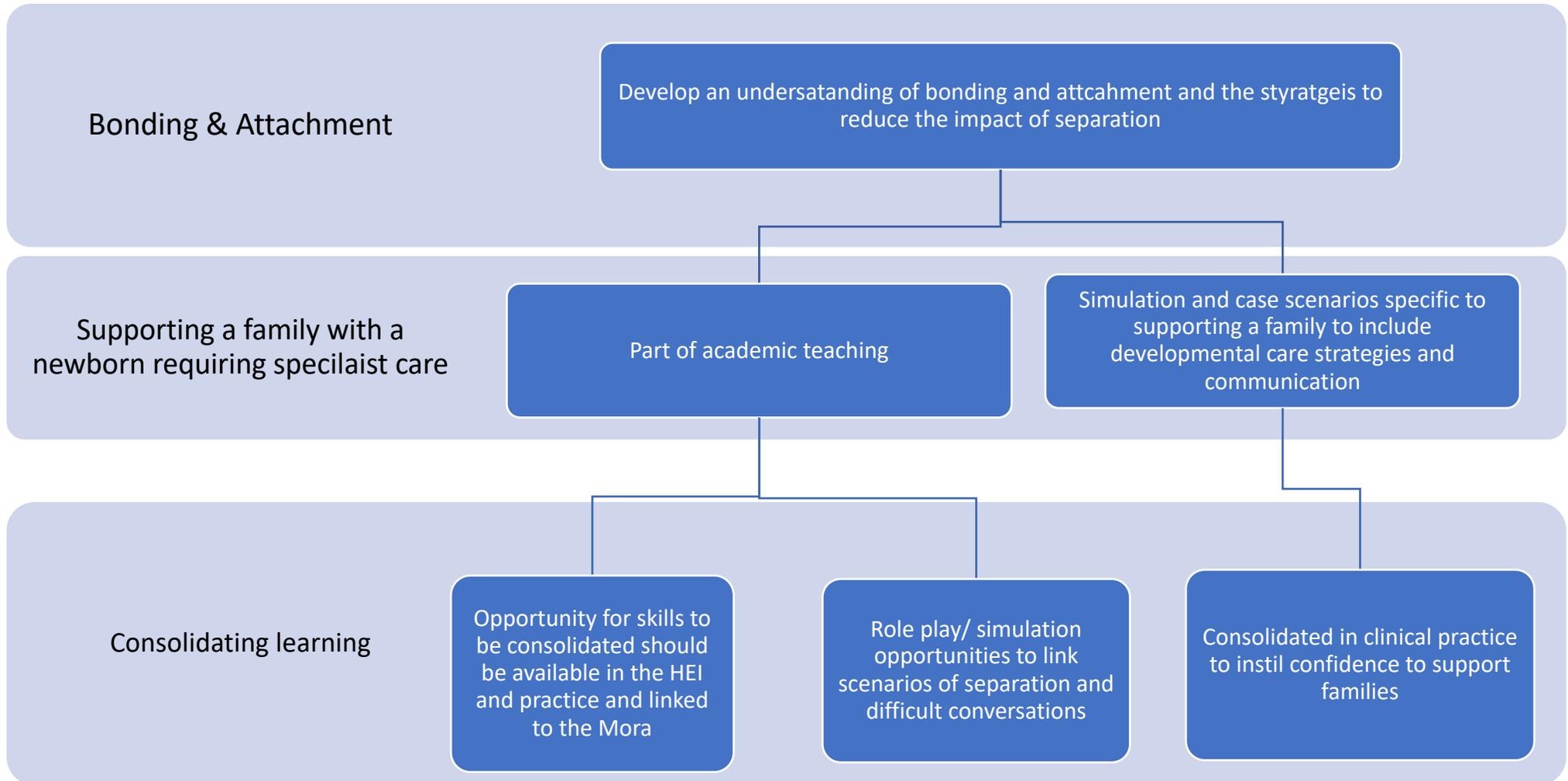
Bonding and Attachment

For learners to recognise the impact of separation for the families of newborn admitted to the neonatal unit they must fully understand bonding and attachment. Mothers of infants who require neonatal care begin their experience of parenthood in the unfamiliar and often intimidating environment of the newborn intensive care unit. This has been evidenced to have profound impact on families and specifically mothers. The separation between a new mother and her baby we do not fully understand the impact, however some studies have suggested that newborns who are born ill and are separated from their mothers are at the highest risk for disturbances in the development of maternal newborn attachment. This has led to the recognition that all should be done to firstly avoid separation and if this is not possible then to ensure that the family is fully emersed in the care of their newborn. To ensure healthcare professionals, understand this it is imperative that key topics thread throughout all undergraduate midwifery educations. There are bonding and attachment, the impact of separation, developmental care and more recently Family integrated care (FiCare). Families' perceptions of the quality of the healthcare they have received are highly dependent on the quality of their interactions with the healthcare team so teaching good communication must be interwoven throughout all the education provided and consolidated in clinical practice.

There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- Recognition and understanding of the impact of separation
- Understanding of boding and attachment theories
- Communication skills
- Brain development and developmental care strategies
- Family integrated care

This links to the MORA: IP5.3, P10.12, N2.6 & N6.5



Neonatal Skin

The management of newborn skin is an area that can cause confusion specifically when parents ask advice to what products they should purchase for use at home. It is important that undergraduate midwifery learners are equipped with the correct knowledge and skills to be able to deal with these questions. They should be encouraged to analyse the evidence to ensure that policy and guidelines are following best practice. It is important that midwifery learners are given the skills of bathing a newborn and how to manage a nappy area where the skin is compromised or infected. The learner should understand what constitutes a normal change in the skin. And what requires escalation to the medical team of further investigation. This should be part of the Newborn Infant Physical Examination theory however is important for learners of all levels.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors on transitional care, postnatal units, and neonatal placement and the delivery unit.

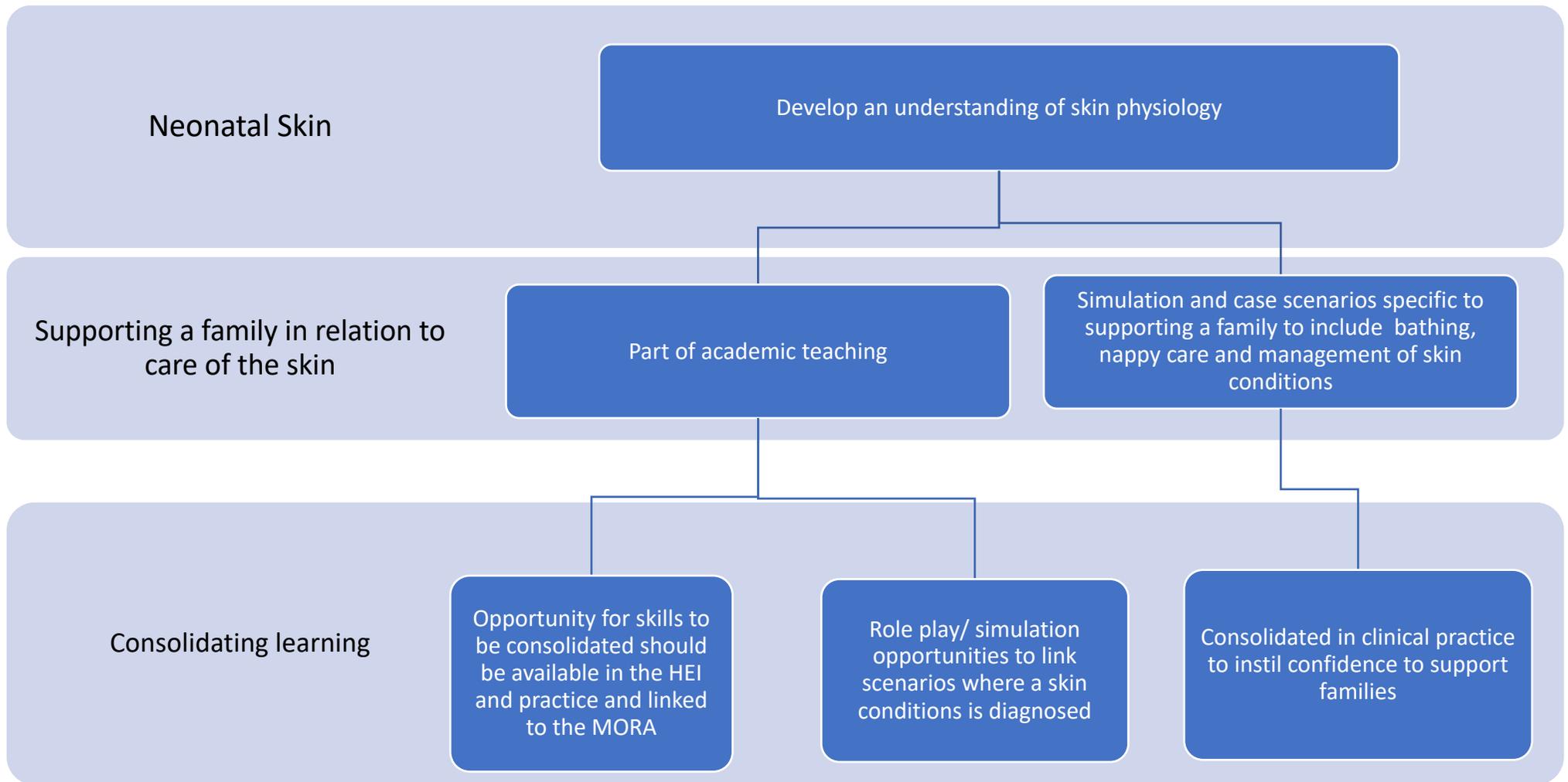
There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- Recognition and understanding of the skin pathophysiology
- Awareness of skin conditions and the recognition of birth marks and other congenital features
- How to manage skin compromise or infection
- Links to escalation and documentation

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby preferably with a range of skin tones

This links to the MORA: N1.1, N1.2 & N6.1



Newborn Nutrition

The importance of newborn nutrition is paramount and should thread throughout all teaching to ensure that the learner is confident to support parents and manage the newborn. The understanding of why some newborns may be more at risk and require additional support is vital for safe transition of all newborns. The skills of breast-feeding support and other supportive skills such as passing a nasogastric tube need to be accomplished by the learner. The management of newborns and their families related to feeding and nutrition link with most other sections within this document and early support can often avoid admission to a neonatal unit and separation of mother and baby. It is imperative that learners are supported to analyse current evidence, understand, and question Trust guidance. There should be links to Unicef BFI and the use of human milk.

- The theoretical aspect of this learning should be taught by academic teams prior to attending a neonatal placement.
- Skills simulation should be available to support the underpinning theory applied to case scenarios.
- The consolidation of this learning can then be applied to the clinical setting whilst in a placement environment whilst working with practice supervisors on transitional care, postnatal units, and neonatal placement and the delivery unit.

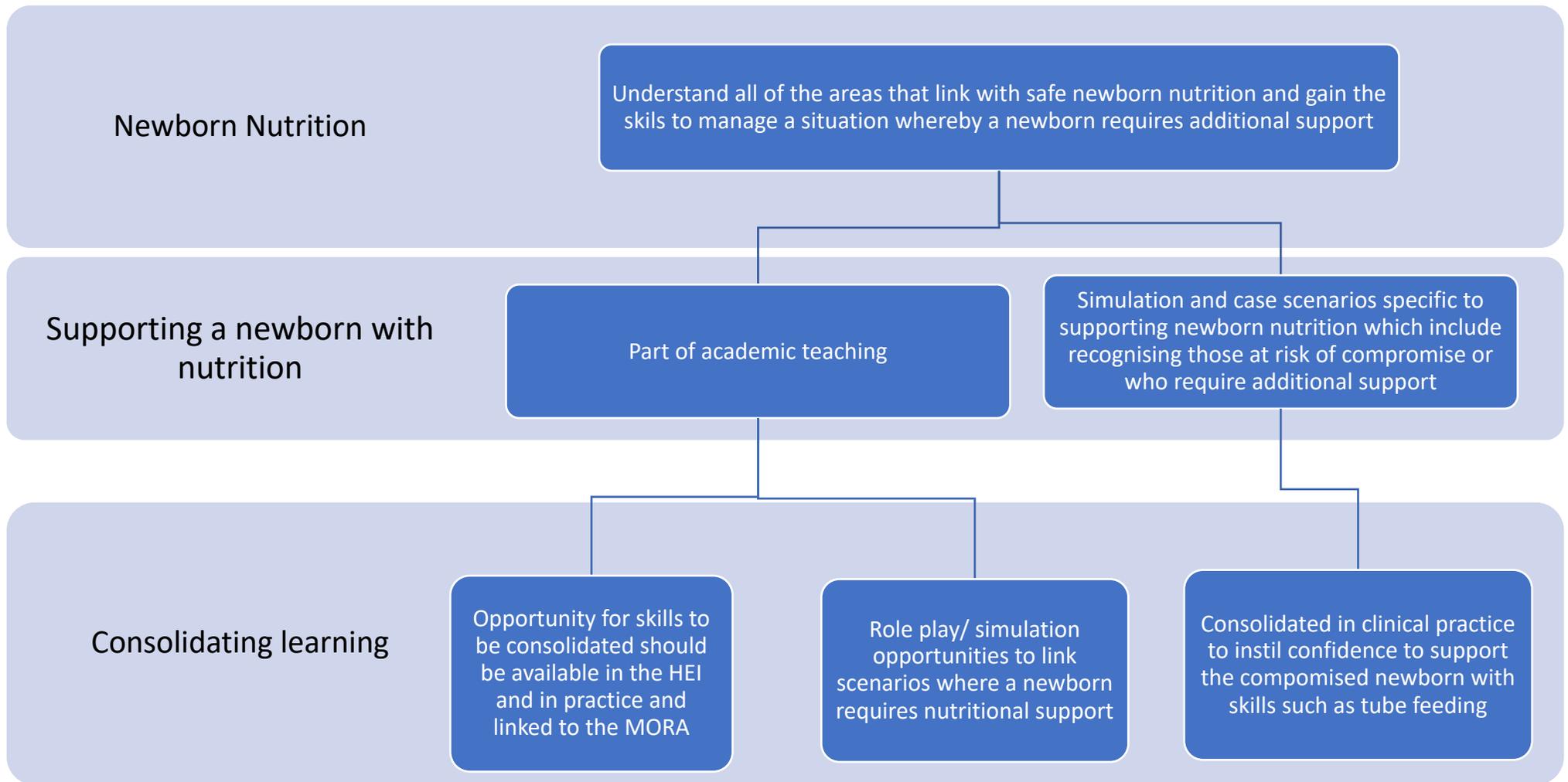
There are key areas that should be included within this teaching which can be achieved through theoretical teaching, practice-based learning, and skills simulation these include:

- Recognition and understanding of the gastrointestinal development
- Awareness of how disease and situations which compromise the newborn gut such as asphyxia
- Why human milk is the nutrition of choice and the evidence to support this
- How to manage and support newborn nutrition including the skills of nasogastric and orogastric tube feeding
- Links to human milk banks and the benefits of human milk

The recommended but not exhaustive list of equipment required for skills/ simulation teaching should include:

Sim baby
Breast pumps
Feeding equipment
Feeding tubes

This links to the MORA: IP5.2, IP5.3, IP5.4, P5 (all proficiencies), N2 (all proficiencies) & N6.2



Conclusion

This document does not claim to be by any means the exhaustive list of what should be taught to undergraduate midwifery learners in relation to neonatal care. This offers a standard of key topic areas that should be included and how they can be delivered to enhance the clinical placement opportunity. The document was developed in collaboration with stakeholders from clinical trusts and higher education institutions within the North West of England. This is not an implementation guidance as it is a nonprescriptive approach to support teams in all areas to recognise the minimum education that undergraduate midwifery learners should receive. The links to simulation and skills requires equipment and a facility suitable for this to take place and it is recognised that not all HIEs will have currently have this however by offering a guide to suggest the minimum equipment required was following consultation with HIE stakeholders and therefore has been included.

Next Steps

Implementation of this framework was out of scope of the commissioned work however, given the excellent stakeholder engagement with the project further work to support implementation would allow the benefits of the framework to be realised across the North West and potentially beyond.

Proposed implementation requirements include:

- Further engagement work with all stakeholder groups with a focus on embedding this framework into education and clinical practice
- A series of workshops, working with academics, clinical educators, and students to demonstrate how the proposal can be utilised
- Evaluation of stakeholder experiences of undergraduate midwifery education during and following implementation to measure the impact of this framework

If support for implementation is made available in an appropriate timeframe this could be developed with current stakeholders within this work.

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