



British Association of
Perinatal Medicine



Terms of Reference for the NeoFOCUS-UK Group (BAPM Special Interest Group (SIG) on neonatal functional haemodynamics and point of care ultrasound):

Purpose of the group

To promote the safe and effective use of neonatal targeted functional echocardiography and point of care ultrasound (POCUS).

Definitions:

For this document, we employ existing definitions:

POCUS - The use of a portable, point of care ultrasound performed by the treating clinician at the bedside for diagnostic, therapeutic, and procedural purposes, in response to a specific clinical question or need.

In the event of acute decompensation (crashing neonates), the goal of:

- 1- Cardiac POCUS is to assess pericardial effusion, global systolic myocardial function, heart filling, catheter malposition, pulmonary hypertension, and ventricular symmetry.
- 2- Lung POCUS is to rule out significant pneumothorax, complete atelectasis or pleural effusion that could have led to acute decompensation.
- 3- Abdominal POCUS: rule out free fluids and other significant neonatal gut pathologies.
- 4- Cranial POCUS: rule out significant intracranial/intraventricular bleeding.

Its principal role is the time-sensitive assessment of the symptomatic patient and the immediate identification of pathologic processes that can be diagnosed rapidly with standard basic views. This will need appropriate training and accreditation.

NPE (Neonatologist Performed Functional Echocardiography) - A comprehensive echocardiogram and functional haemodynamic assessment performed at the bedside by the neonatologist. Whilst which in addition to functional assessments, aims to rule out significant congenital cardiac lesions and seek advice and further assessment by paediatric cardiology team.

A preliminary activity of the Group will be to review and where necessary update these definitions.

Background

- There is a growing interest in neonatal echocardiography, neonatal haemodynamics and POCUS as a neonatal sub-specialty.
- There is a growing evidence base for the role of neonatal haemodynamics, echocardiography and POCUS to improve clinical decision making and outcomes in newborn infants.
- Traditionally echocardiography and POCUS have been performed by cardiologists and radiologists. However, there is a growing recognition and evidence internationally for the



British Association of
Perinatal Medicine



use of ultrasound for physiological assessment including of the cardiovascular and respiratory systems, and to support invasive procedures including for example central line placement.

- NeoFOCUS-UK recognise that neonatologists across the UK are already performing echocardiography and POCUS as part of routine clinical care, but with little guidance or framework that i) delineates a clear boundary between haemodynamics (physiology based echocardiography and structural based paediatric cardiology ii) clarifies the scope of neonatologist performed echocardiography (NPE) versus POCUS versus cardiologists performed echocardiography (primarily structural assessment) iii) clarifies the role of the neonatologist versus cardiologist versus radiologist and clear governance structures iv) recognises the varying levels of skills, knowledge and experience through an accreditation process that is accessible and achievable within the UK

TRAINING:

- In 2016, an expert consensus statement “Neonatologist-performed Echocardiography (NPE) training and accreditation in UK was published (REF) was developed jointly between neonatologist and paediatric cardiologists <https://pubmed.ncbi.nlm.nih.gov/26362538/>. Implementation has been a challenge due to the need for a cardiology placement for 6 months, which is not possible for most training deaneries to provide. This has made the accreditation process inaccessible and as a result there is no formal accreditation process that distinguishes an individual with no echocardiography knowledge/skills from those with basic, advanced or specialist skills/experience.
- Two international consensus statements recommending use of NPE / POCUS, not yet implemented.
- No neonatal POCUS training. Existing POCUS training is established for older children and adults.
- The Group will aim to develop an updated expert consensus and develop training and accreditation in neonatal functional echocardiography and POCUS.

RESEARCH/Evidence-base:

- Scientific literature on the positive impact of the implementation for NPE programmes is growing.
- Normative data for standard echocardiography indices for preterm and term infants have been developed.

Group Aims

In the first three years the group will:

1. Relaunch the group as a special interest group of BAPM. Broaden membership to include BAPM members with an interest in neonatal haemodynamics and POCUS.



**British Association of
Perinatal Medicine**



2. Collaborate with other professional groups to establish NeoFOCUS-UK as the expert advisory group or 'go to place' for POCUS and neonatal haemodynamics in the UK. A formal advisory/collaborator group will be established that includes relevant national and international representation from radiology, cardiology, adult and paediatric critical care, Neonatal Hemodynamic Research Centre (NHRC), Paediatricians with Expertise in cardiology special interest group (PECSIG), European Society of Pediatric Research, Neonatologist Performed Echocardiography (NPE) Special Interest Group, European Society of Paediatric and Neonatal Intensive Care (ESPNIC), and Children Acute Thoracic Ultrasound (CACTUS) programme led by the Paediatric Intensive Care Society (PICS).
3. Co-ordinate multi-disciplinary working groups with BAPM to develop frameworks for practice on relevant topics. (See Appendix for details.)
4. Delivering educational webinars to share latest evidence and role of POCUS and integrated haemodynamic approaches.

Future work of the group may include:

- Lead/co-ordinate research and quality improvement initiatives related to POCUS and neonatal haemodynamics.
- Work in collaboration with the RCPCH Neonatal College Specialty Advisory Committee (CSAC) and/or other professional and academic bodies, to develop an accredited POCUS and neonatal haemodynamics training programme for inclusion in the neonatal specialist curriculum. This will recognise key competencies of individuals who have demonstrated the necessary knowledge and skills and could be comprised of different levels of competency (e.g. basic/advanced/specialist)
- Development of a process for accrediting training centres and training courses.
- Offering CPD and peer-review sessions for clinicians using POCUS and integrated haemodynamic skills

Relationship with BAPM

NeoFocus-UK is a Special Interest Group of the British Association for Perinatal Medicine and is accountable to the BAPM Executive Committee and BAPM membership. The membership database will be held by BAPM.

The group will retain an independent committee responsible for developing and delivering the work of NeoFocus-UK. BAPM will support the group by helping to run committee elections, maintaining a web presence, running joint webinars, and communicating with members.

The NeoFocus-UK committee and members will keep BAPM informed of relevant updates in their field that should be shared with the wider BAPM membership and help answer POCUS and neonatal haemodynamics-related questions posed to the BAPM.

NeoFocus-UK will submit an annual summary of activities to BAPM. NeoFocus-UK will inform BAPM of any changes/updates in the leadership of the group.



**British Association of
Perinatal Medicine**



Membership

- BAPM members with relevant expertise or a specialist interest in POCUS and neonatal haemodynamics.
- Nurses, ANNPS and Patient & family representatives.

The Executive Committee

Any member of the SIG can apply to join the Executive Committee. Where more than one member applies for a position then an election will be held by anonymous vote by the SIG membership. If a position receives only one nomination then this person can be elected to committee following a vote of existing committee members.

Terms will usually be for 3 years. Committee members can stand for the same role for multiple terms but the role must be advertised openly to allow new nominations at the end of each term. The initial terms of members may be shortened or extended to allow for a staggered turnover of new committee members.

- 1- Chair
- 2- Vice chair
- 3- Treasurer
- 4- Secretary
- 5- Trainee representative (Present to 2027)
- 6- Parents/family representative
- 7- Nurse/ANNP representative
- 8- Sub-group leads:
 - a. Guidelines & Frameworks (2 leads).
 - b. Training & Accreditation (2 leads).
 - c. Education & CPD (2 leads).
 - d. Research & evidence generation (2 leads).
 - e. Communication (including social media and website) lead.
 - f. Membership & elections lead.

In the event of a committee member stepping down, new nominations will be sought, and voting held to appoint a new member.

In the event of a leadership group member taking a leave of absence of > 2 months & <6 months an interim appointee made be identified with the agreement of the Co-chairs. If absence is more than 6 months, then a replacement should be requested.

Finances

Any money held on behalf of NeoFOCUS-UK going forward will be held by BAPM in a restricted account. The group previously had a fund at Glasgow Children's Hospital which will be reviewed.



British Association of
Perinatal Medicine



Appendix: Proposed guidance documents that could be developed by NeoFOCUS-UK.

(Provisional aims are included but will be reviewed before development)

1. **Neonatologist Performed Echocardiography framework:** The overarching aim of the framework is to develop principles and recommendations to promote the safe and effective use of neonatal haemodynamics for neonatal professionals. Objectives include:
 - a. Outline the purpose/scope of Targeted Neonatal Echocardiography (for functional haemodynamic assessment versus structural abnormalities).
 - b. Identify the most important indications.
 - c. Identify the role and remit of neonatologists in performing these assessments
 - d. Recommendations for clinical governance structure: standardised processes for: image acquisition, image interpretation, measurement performance, clinical application, interpretation, appropriate involvement of paediatric cardiology (indications)
 - e. Training: recommendations for individuals and training centres
 - f. Training course best practice framework e.g. topics to include/ neonatal echocardiography simulation models (develop endorsement process)

2. **Use of Lung Ultrasound (LUS) including**
 - a. Diagnostic and predictive use of LUS in preterm infants, including diagnosis of respiratory distress syndrome, prediction of respiratory status, surfactant response and extubation.
 - b. Late preterm and term infants with respiratory distress: including differentiation of surfactant responsive and non-responsive disease
 - c. Diagnostic utility of LUS in common lung conditions: pneumonia, meconium aspiration syndrome (MAS), pneumothorax, pleural effusion, congenital diaphragmatic hernia and congenital pulmonary airway malformations
 - d. Use of LUS to guide invasive procedures: including chest drain insertion and assessment of endotracheal tube position.

3. **Ultrasound facilitated Central Line placement**
 - a. Basic principles of using ultrasound to confirm central line placement
 - b. Modules and guidelines specific for umbilical lines placement (UAC, UVC)
 - c. Modules and guidelines specific for Peripherally Inserted central catheters from upper limbs, lower limbs and Scalp.
 - d. Troubleshooting with ultrasound in central line placement—advanced level.

4. **Functional haemodynamic assessment and management:**
 - a. Core Principles of functional haemodynamic assessment and pathophysiology-based management
 - b. Preterm haemodynamic phenotypes including patent ductus arteriosus, pulmonary hypertension and low cardiac output states
 - c. Low flow states and systemic hypotension
 - d. Neonatal sepsis



- e. Acute hypoxic respiratory failure and pulmonary hypertension phenotypes including PPHN
- f. Congenital diaphragmatic hernia
- g. Chronic pulmonary hypertension, including in BPD
- h. Hypoxic ischaemic encephalopathy
- i. Infants with IUGR
- j. Infants following twin to twin transfusion syndrome

5. Point of care Abdominal Ultrasound:

- a. Identification of free abdominal fluids
- b. Identification of urine in the bladder
- c. Identification of portal venous gas
- d. Aiding diagnosis and monitoring of NEC

References:

1. Singh Y, Gupta S, Groves AM, Gandhi A, Thomson J, Qureshi S, Simpson JM. Expert consensus statement 'Neonatologist-performed Echocardiography (NoPE)'-training and accreditation in UK. *Eur J Pediatr.* 2016 Feb;175(2):281-7.
2. Heuchan AM, Patel N, Hunter L, Montasser M. Neonatologists performed echocardiography: a pilot programme for delivering training and accreditation in the UK.
3. Elsayed Y, et al. Point-of-care ultrasound (POCUS) protocol for systematic assessment of the crashing neonate—expert consensus statement of the international crashing neonate working group. *European Journal of Pediatrics* (2023) 182:53–66. *Infant* 2020;16 (6), 1-5.
4. Giesinger R, et al. Impact of Early Hemodynamic Screening on Extremely Preterm Outcomes in a High-Performance Center. *American Journal of Respiratory and Critical Care Medicine*, May 2023.
5. Giesinger R, et al, Impact of early screening echocardiography and targeted PDA treatment on neonatal outcomes in “22-23” week and “24-26” infants. *Seminars in Perinatology*, March 2023.
6. Stewart D, et al. Use of Point-of-Care Ultrasonography in the NICU for Diagnostic and Procedural Purpose, clinical & technical reports. *Pediatric*, December 2022.
7. Elsayed Y et al. A new intestinal ultrasound integrated approach for the management of neonatal gut injury. *European Journal of Pediatrics* (2022) 181:1739–1749
8. Priyadarshi A et al. Neonatologist-performed point-of-care abdominal ultrasound: What have we learned so far? *Front Pediatr.* 2023; 11: 1173311
9. Ruoss L et al. Lung Ultrasound in the Neonatal Intensive Care Unit: Does It Impact Clinical Care? *Children* 2021 Nov 29;8(12):1098.