Certificate in Clinician Performed Ultrasound (CCPU) Syllabus

Neonatal Cranial Ultrasound

Approved by Board of Examiners 03 March 2025.

Australasian Society for Ultrasound in Medicine
P (61 2) 9438 2078 F (61 2) 9438 3686 E asum@asum.com.au W www.asum.com.au
ACN 001 679 161 ABN 64 001 679 161

Neonatal Cranial Ultrasound Syllabus

Purpose

This unit is designed to cover the theoretical and practical curriculum for Neonatal Cranial Ultrasound. The unit aims to prepare the candidates to obtain ultrasound images to answer the specific clinical question and to optimise the clinical management of neonates.

Prerequisites:

The CCPU in Neonatal Cranial Ultrasound is open to Neonatologists and Trainees registered with The Royal Australasian College of Physicians, Neonatal and Perinatal Medicine. International graduates employed as neonatal fellows, registrars, or CMOs may apply to the CCPU Board to register for this unit if they can demonstrate appropriate employment and AHPRA registration. Such applications are considered on a case-by-case basis.

CCPU candidates engaged in ultrasound assessment of patients should have:

- Enrolled in the CCPU
- Reviewed ASUM Code of Conduct and Safety Policies
- Completed the ASUM CCPU online physics tutorial quiz. Candidates can also choose to complete the physics tutorial and quizzes concurrently with obtaining clinical training, however this must be completed prior to the final summative assessment.
- Complete CCPU online neonatal unit.

Candidates must be affiliated with a recognised institution for training in CCPU Neonatal Cranial ultrasound. Recognised institutions must:

- Be associated with a neonatal intensive care unit.
- Have a close affiliation with a paediatric radiology service.
- Have at least one clinician whose qualification is recognised by the ASUM council as a qualification for training.
- Have access to ultrasound equipment to allow appropriate quality, accuracy, and repeatability of scanning. Equipment should be no older than 10 years.

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Course objectives

On completing this unit, candidates will be able to understand and appreciate the following:

- The needs of an infant during scanning
- Infection risks during scanning
- Ergonomics of the ultrasound machine
- The applied physics of Ultrasound: e.g., optimal choice of the probe, settings for neonatal scanning, image optimisation, colour Doppler and Pulse wave Doppler.
- The key anatomical structure of a neonatal brain as it relates to standard windows via anterior fontanelle.
- Describe the clinical questions, related to the neonatal cranial ultrasound which may typically be addressed using focussed point of care ultrasound scanning.
- Confidently acquire a full set of images of the normal infant brain via the anterior fontanel.
- Visualisation of inferior cranial fossa structures (e.g., Cerebellum, middle cerebral artery Doppler) via mastoid and temporal windows
- Diagnose common pathologies. E.g., germinal matrix/intraventricular haemorrhage, parenchymal lesions including bleed and periventricular leukomalacia, hydrocephalus.
- Recognise common structural abnormalities of cerebral development: e.g., Absent corpus callosum.
- Performing and interpreting Doppler studies of the anterior and middle cerebral artery; and superior sagittal sinus.
- Diagnose artefacts and normal variants in neonatal cranial scan.
- Understand the limitations of cranial ultrasound.
- Interpreting ultrasound findings concerning clinical scenarios.

Unit Content and Teachers Methodology

Course Content

The unit will present learners with the following material:

<u>Anatomy:</u>

Key anatomical structures as they relate to the standard coronal and sagittal views.

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Pathology:

Common pathologies. E.g., Germinal matrix and intraventricular haemorrhages, periventricular leukomalacia, hydrocephalus.

Imaging skills:

The unit will teach the following imaging skills:

- Framing an appropriate clinical question for the examination
- Appropriate care of the patient during examination, including asepsis, thermal care
- Appropriate use of ultrasound machine
- Appropriate selection of probes and optimisation of images
- Annotating images.
- Competently use coronal and sagittal cranial ultrasound windows via anterior fontanelle to demonstrate normal anatomical structures.
- Use of posterior fontanel views to demonstrate occipital horn bleed, mastoid view to show cerebellar bleed are optional skills.
- Recognise common pathologies. E.g., germinal matrix/intraventricular haemorrhage, periventricular leukomalacia, hydrocephalus
- Performing and interpreting Doppler studies of anterior/middle cerebral artery.
- Performing interpreting Doppler studies of superior sagittal sinus.
- Diagnose artefacts and normal variants in neonatal cranial scan.
- Appropriate clinical interpretation and documentation.

Recording:

The unit will teach learners how to annotate and record images with standard conventions and obtain a series of images to clearly demonstrate normal anatomy or abnormalities.

Limitations:

During training, all scans should be reviewed by a competent scanner (or paediatric radiologist). There is a need to recognise when a referral is mandatory because of an incomplete scan or a possible anatomical or structural abnormality. Important management decisions should not be made without such experienced review.

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Interpretation:

The unit will teach learners the skills needed to competently interpret ultrasound findings in relation to the clinical scenario.

Documentation:

Trainees will be taught the documentation skills of neonatal cranial scan results in a structured and organised way. It is recommended that documentation of CPU studies specifically mention that this was a "clinician performed ultrasound" to distinguish it from studies by a consultative diagnostic imaging specialist.

Teaching Methodologies for the Neonatal Cranial Ultrasound Unit

Learners will receive reference material outlining the unit curriculum.

Early in the unit, candidates are required to complete the ASUM CCPU online physics module. They will also complete the lectures covering the introduction to the 2D anatomy of the neonatal brain and neonatal cranial ultrasound pathology via the myASUM training portal. This will be followed by a multi-choice quiz with a required pass rate. The lectures presented will cover substantially the same material as the ones printed in this curriculum document.

Throughout the period of logbook acquisition, accredited local supervisors will continue practical bedside teaching, adhering to the Neonatal Cranial CCPU curriculum. A focus on skill-based competence rather than the number of hours scanning will be the focus. Documentation of these acquired learning goals forms part of the logbook assessment.

Expected standards of practice

Key clinical questions addressed in PoCUS contexts:

- Am I able to identify key anatomical landmarks.
- Is there any pathology.
- Are there any artefacts.

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Minimum expected ultrasound data acquisition/protocols:

Preparation

- Prepare clinical environment.
- Prepare patient, including informed consent where possible (refer to ASUM code of conduct) in line with state and hospital/practice policy.
- Select and prepare ultrasound and ancillary equipment in line with ASUMs safety policies.
- Enter patient data into ultrasound equipment.

Image acquisition

- Acquire and optimise ultrasound images/data.
- Identify relevant anatomical features and landmarks.
- Identify relevant artefacts,
- Respond to ultrasound artifacts, if required, to improve diagnostic quality of images/data.

Minimal recorded images/ultrasound data

The candidate should record the images as described in the unit content, unless the patient's clinical situation (for example in an unstable ventilated patient) renders this impracticable and/or unsafe. In this situation, the candidate should record whatever images are obtainable, in the time available, to answer the clinical question without allowing the ultrasound examination to interfere with ongoing medical treatment.

Sonographic appearances of expected positive, negative and equivocal findings.

- Describe ultrasound appearances using correct sonographic terminology.
- Identify and describe conclusive findings, positive or negative.
- Identify limitations of an examination, including specific examples/situations if appropriate
- Identify the relevance of equivocal findings.

Integration of ultrasound findings with clinical information

- Describe relevance of ultrasound findings correlated to clinical presentation and other data.

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- Integrate information with ongoing clinical management of patient.

Post examination.

- Ensure examination and findings adequately recorded in patient clinical record.
- Clean ultrasound equipment safely and correctly as per ASUM Safety Protocols
- Store ultrasound equipment safely and correctly.

Primary Supervisor

- Refer to the CCPU Regulations for Primary Supervisor criteria and the Supervisor Handbook, which defines the roles and responsibilities of the primary supervisor.
- All assessments (both formative and summative) and logbook verification declarations must be completed by the candidate's approved Primary Supervisor. Logbook supervision requirements are detailed in the Supervisor Handbook.
- At the discretion of the primary supervisor, associate supervisor/s may assist with the training and learning required for the logbook and may sign off individual logbook entries. Refer to the CCPU Supervisor Handbook for associate supervisor criteria.
- Supervisors will be familiar with the current curriculum to support candidates through the program.
- Supervisors will teach optimal image acquisition and, most importantly, clinical integration of this information and how it might influence management in each case.

Assessments

Assessments are focussed on the candidate demonstrating the knowledge, skill and ability to perform an accurate, valid, efficient, and clinically relevant ultrasound examination which has the potential to have a positive impact on patient clinical management. All assessments must be completed by the candidate's nominated Primary Supervisor.

Candidates are expected to develop a solid foundation of key ultrasound knowledge and skills and apply these to clinical practice in a guided, supervised, incremental fashion. As their experience builds, candidates may wish to undertake further formal training and education to further develop and enhance their skills.

The successful completion and documentation of the following assessments in Neonatal Cranial Ultrasound are required:

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- Completion of physics module
- Watching online lectures and completing multiple-choice questions
- Completion of Logbook requirements as outlined below. (See Cranial logbook here).
- Letter of endorsement from the primary supervisor confirming the duration of training within a recognised institution in neonatal Ultrasound, contemporaneous interaction between the candidate and supervisor, and satisfactory level of completion.
- Two (2) formative assessments of clinical skills, specifically related to the assessment of the neonatal cranial ultrasound examination, completed by the primary supervisor (See Cranial Formative Assessment)
- One (1) summative assessment of clinical skills, specifically related to the assessment of neonatal cranial ultrasound examination, completed by the primary supervisor (See Cranial Summative Assessment)
- Minimum of two ultrasound scans (one of which should have a pathology) in digital format (DICOM) uploaded to ASUM for review by the examiner. These scans should include all 6 coronal and 5 sagittal views. A transverse temporal view, mastoid view, and posterior fontanel sagittal view are optional. The scans should be accompanied by a brief synopsis including the following information:
    - A brief outline of the patient, including gestation, postnatal age, weight (no identifiers)
    - Indication for the scan
    - Detailed interpretation of images, including any technical difficulties (e.g., small anterior fontanel, unstable baby)
    - Inference and further plan (including how the scan informed clinical management)

- The scans will be assessed against the published neonatal style (see Cranial Style Guide) and the ability of candidates to interpret the images against the documented Standards of Practice. If a reviewer deems a candidate not to have met the criteria for awarding CCPU, the images will be reviewed by a second examiner.

- Please refer to the CCPU Regulations for specific timing requirements related to the completion of these assessments.

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Logbook Requirements

For the unit Neonatal Cranial Ultrasound candidates must demonstrate, in their verified logbook, that they have personally performed a minimum 30 cerebral ultrasounds (at least 50% of these should show abnormality).

- All ultrasound scans should be performed in a clinical environment.
- The logbook entries must be signed off by a suitably qualified assessor (CCPU, DDU, Radiologist, sonographer registered with AIR or NZ MRTB in the relevant field, or other qualification as approved by the CCPU board).
- There should be direct and contemporaneous supervision of learners by an accredited supervisor who may not always be the candidate's primary supervisor. If learners have problems finding a supervisor to sign off the logbook, the committee will be prepared to consider direct electronic submission of ultrasound scans to demonstrate competence.
- While completing the logbook, the supervisor will refer to the Competence Assessment Forms (See Cranial Formative Assessment) as a guide.
- These studies should be de-identified and stored digitally (DICOM format) for review if required.
- Refer to (Cranial logbook here) for the neonatal Cranial ultrasound Logbook template.
- At the discretion of the ASUM CCPU Board candidates may apply for recognition of prior learning under the CCPU Recognition of Prior Learning Policy.

Resources/suggested learning activities

- Clinical training
- ASUM Standards of practice documents
- ASUM Drive
- Evans N, Malcolm G. Practical Head Ultrasound for the Neonatologist. A multimedia CDROM, Royal Prince Alfred Hospital 2000. https://payhip.com/PracticalNeonatalUltrasoundNeonatalUltrasound
- An Atlas of Neonatal Brain Sonography By: Paul Govaert, Linda S. de Vries. 2nd Edition, Publisher: Mac Keith Press / Wiley; Date published 30th June 2009; ISBN 9781898683568

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Recertification

Once full accreditation of a candidate has been obtained in relation to the Neonatal Cranial Ultrasound CCPU, demonstration of ongoing maintenance of competence will be required every 5-year period by providing evidence that the candidate has met practice requirements and Continuing Professional Development (CPD) requirements.

To achieve recertification the candidate must:

- Continue to fulfil the conditions for Eligibility and Admission to the CCPU.
- Record at least five (5) points of relevant CPD per year for the Neonatal Cranial Ultrasound.
- The recertification logbook must include the minimum of 10 scans, to be completed in 24 months prior to your recertification deadline.
- All scans must be clinically indicated, and the logbook must be submitted to ASUM with your recertification application.
- Supervised scans can be included in your recertification logbook if the following criteria met:
- You directly supervised the scan; this is clearly indicated in the logbook along with your name of the trainee and both your name and the trainee's name are logged on the ultrasound machine/report.
- Recertification will only be given for those specialized units where recertification requirements have been met.
- A CCPU holder who fails to meet the recertification requirements will be removed from the ASUM CCPU certified list and will be required to forgo the use of the post nominals.
- The recertification grace period is 3 years after the original recertification due date.

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