

# Certificate in Clinician Performed Ultrasound (CCPU) Syllabus

**Neonatal Lung Ultrasound** 

Approved by Board of Examiners 03 March 2025.

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# **Neonatal Lung Ultrasound Syllabus**

#### Purpose

The candidate demonstrates skill in obtaining valid and efficient ultrasound images/clips and data in the assessment of the neonatal lung to answer the specific clinical question. The candidate can recognise when the findings are positive, negative or equivocal and use this assessment to enhance the clinical management of the patient.

#### **Prerequisites:**

The CCPU in Neonatal Lung Ultrasound is open to Neonatologists and Trainees registered with The Royal Australasian College of Physicians, Neonatal and Perinatal Medicine. International graduates filling temporary fellowship positions 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 in a PoCUS setting should have:

- Enrolled in the CCPU.
- Reviewed <u>ASUM Code of Conduct</u> and <u>Safety Policies</u>
- Completed the ASUM CCPU online physics tutorial quiz.
- Complete the CCPU neonatal online learning material "Introduction to Lung Ultrasound in Neonatology" (version 2).
- Attended a CCPU accredited course or equivalent meeting ASUM requirements for recognition of prior learning.

#### **Course objectives**

The candidate can:

 Describe the clinical questions, related to the neonatal lung ultrasound which may typically be addressed using focussed point of care ultrasound scanning, as described in relevant and contemporary peer-reviewed literature or relevant published protocols or standards of practice.

- Demonstrate the technical (sonographic) ability to acquire a satisfactory ultrasound examination which is suitable to answer the clinical question, including any applicable measurements.
- Describe the diagnostic criteria, as described in relevant and contemporary peer-reviewed literature or relevant published protocols or standards of practice, for ultrasound findings which would support a positive, negative, or equivocal diagnosis.
- Describe the limitations of ultrasound in assessing the neonatal lung in a PoCUS context.
- Demonstrate the ability to interpret the ultrasound data to determine if the findings support a positive, negative, or equivocal answer to the specific clinical question.
- Demonstrate the ability to determine the appropriate on-going patient management as a result of the ultrasound findings in conjunction with other clinical information.
- Demonstrate the ability to describe and adequately document the ultrasound findings in the patient's clinical record in such a way as to facilitate satisfactory continuity of care of the patient.
- Recognition of lung physiology and pathology; aeration, pneumothorax, consolidation, pleural effusions.
- An understanding of the limitations of lung ultrasound.

# Unit Content and Teachers Methodology Course Content

The course will present learners with the following material:

- "Introduction to Lung Ultrasound in Neonatology" (Version2):
  - Physics of lung ultrasound
  - Recognition of normal lung
  - A lines
  - B lines
  - Pneumothorax
  - Lung consolidation
  - Pleural effusion
  - Guidance on how to perform and report point-of-care lung ultrasound.
  - Research & evidence.
  - Quiz

- ASUM Neonatal Lung Ultrasound Workshop:
  - Consolidate knowledge from online learning material and reading.
  - Practical phantom models understanding artefact creation.
  - Hands on scanning using skills in obtaining images in neonatal patients.
  - Worked clinical examples of interpretation of lung ultrasound.
  - Current evidence and research questions, controversy.
  - Questions & answers.

#### Imaging Skills:

- Framing an appropriate clinical question for the examination
- Appropriate care of the patient during examination including asepsis.
- Appropriate use of ultrasound machine
- Appropriate selection of probes and optimisation of images
- Annotating images
- Appropriate clinical interpretation and documentation.

# **Teaching Methodologies for the CCPU**

# Course Requirements

- Completion of Online Neonatal Lung Ultrasound course available on myASUM
- Attendance at a 1-day Neonatal Lung Ultrasound Course.

All courses accredited toward the CCPU will be conducted in the following manner:

- A pre-test shall be conducted at the commencement of the course which focuses learners on the main learning points.
- Each course shall comprise at least 3 hours of teaching time of which at least 2.5 hours shall be practical teaching.
- Learners will receive reference material covering the course curriculum.
- The lectures presented should cover substantially the same material as the ones printed in this curriculum document.
- An appropriately qualified clinician will be involved in both the development and the teaching of the course and must be present for the course itself.

- The live scanning sessions for this unit shall include sufficient live patient models to ensure that each candidate has the opportunity to scan (maximal candidate: tutor/machine ratio of 5:1). Models will include normal subjects and patients with appropriate pathologies. Patient simulations may be approved at the discretion of the CCPU Board.
- A compulsory post-test will be conducted at the end of the course.

# Expected standards of practice for Neonatal Lung Ultrasound

# Key clinical questions addressed in PoCUS contexts:

- Is there evidence of pleural sliding throughout?
- What is the dominant artefact pattern (A Line profile; Intermittent B lines; Coalescent B lines; Hepatisation etc.)?
- How does the dominant artefact pattern observed correlate with clinical & radiographical findings?
- Are there signs suggestive of pneumothorax? Can you locate its physical limit (Lung Point)?
- Are pleural effusions present? Can you measure maximum depth at inspiration and expiration?
- Are there signs of non-aeration and how does this correlate with the clinical information?
  (e.g. migrated ETT far into the Right Main Bronchus causing loss of aeration of Right Upper Lobe vs. Left Upper Lobe.)

# Minimum expected ultrasound data acquisition/protocols:

#### **Preparation**

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

#### Image acquisition

• Acquire and optimise ultrasound images/data.

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- Identify relevant anatomical features and landmarks, including;
  - Thymus
  - Superficial tissues of the chest wall
  - Ribs & acoustic shadows
  - Cardiac structures
  - Diaphragm
  - Abdominal organs (liver/spleen/stomach)
  - Pleural Effusions
  - A Prime Profile (suggestive of pneumothorax)
- Identify relevant artefacts, including;
  - Pleural Line & sliding
  - A lines, B lines
  - Hepatisation
- Respond to ultrasound artifacts, if required, to improve diagnostic quality of images/data.

# Minimal recorded images/ultrasound data

The following are the required minimal images to be recorded, unless the patient's clinical situation (for example in an unstable ventilated patient) renders this impracticable and/or unsafe. In this situation, the practitioner 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.

A standardized protocol should be followed for both right and left hemithorax:

- Anterior longitudinal (midclavicular)
- Anterior transverse superior & inferior (delineated by the mammary line)
- Lateral longitudinal (midaxillary)
- Posterior longitudinal (medial to scapular) and transverse planes (inferior to scapular) when clinically relevant.

# 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.
- 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 <u>ASUM Safety Protocols</u>
- Store ultrasound equipment safely and correctly.

#### **Primary Supervisor**

- Refer to the <u>CCPU Regulations</u> for Primary Supervisor criteria.
- All assessments (both formative and summative) and <u>logbook</u> verification declaration must be completed by the candidate's approved Primary Supervisor. Logbook supervision requirements are detailed in the <u>CCPU Supervisor Handbook</u>.
- 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 <u>CCPU Supervisor Handbook</u> for associate supervisor criteria.

#### Assessments

Assessments for clinical units 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 Lung Ultrasound are required:

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- Two (2) formative assessments of clinical skills, specifically related to the assessment of the neonatal lung examination.
- One (1) summative assessment of clinical skills, specifically related to the assessment of the neonatal lung.
- Please refer to the <u>CCPU Regulations</u> for specific timing requirements related to the completion of these assessments.

# Logbook Requirements

For the unit Neonatal Lung Ultrasound candidates must demonstrate, in their verified <u>logbook</u>, that they have personally performed:

- A minimum of 30 Neonatal Lung Ultrasound scans, and remainder illustrating a range of pathology which must include **more than one** example each of:
  - o delayed transitioning (TTN),
  - respiratory distress syndrome (RDS),
  - o pneumothorax,
  - o pleural effusion
- Submits a portfolio of the DICOM images/loops of 5 cases from your <u>logbook</u> with clinical scenarios and interpretation of findings.
- The 'Comparison with Further Imaging or Clinical Outcome' column should describe the further imaging or the final outcome of the patient. In this column, candidates must compare **at least 50% of their logbook findings to further imaging**, this includes stating the imaging method and commenting on whether the further imaging confirmed, contradicted, or expanded on their findings.
- At the discretion of the ASUM CCPU Board candidates may apply for recognition of prior learning under the <u>CCPU Recognition of Prior Learning Policy</u>.

# **Resources/suggested learning activities**

- CCPU <u>Accredited Courses</u>
- Clinical training
- ASUM Standards of practice documents
- "Introduction to Lung Ultrasound in Neonatology" (Version2)
- Reporting Neonatal Lung Ultrasound (see Appendix)
- Clinical Correlation and Further Management: Clinical Examples (see Appendix)

- Lichtenstein DA, Mauriat P. Lung ultrasound in the critically ill neonate. Curr Pediatr Rev 2012;8:217–23.
- Woods PL. Utility of lung ultrasound scanning in neonatology Arch Dis Child 2018;0:1–7. doi:10.1136/archdischild-2017-314538
- Blank DA, Rogerson SR, Kamlin COF, et al. Lung ultrasound during the initiation of breathing in healthy term and late preterm infants immediately after birth, a prospective, observational study. Resuscitation 2017;114:59–65.
- Raimondi F, Cattarossi L, Copetti R, et al. International perspectives: Point-of care chest ultrasound in the neonatal intensive care unit: An Italian perspective. Neoreviews 2014;15: e2–e6.

# Recertification

Once full accreditation of a candidate has been obtained in relation to the Neonatal Cardiac 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 Cardiac Ultrasound.
- The recertification logbook must include the minimum of 20 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.