Certificate in Clinician Performed Ultrasound (CCPU)

Syllabus

Pleural Effusion

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Pleural Effusion Syllabus

Purpose:

This unit is designed to cover the theoretical and practical curriculum for pleural effusion ultrasound.

Prerequisites:

Learners should have completed the ASUM Physics Image Optimisation unit or accredited equivalent.

Training:

Recognised either through attendance at an ASUM accredited pleural effusion course or equivalent.

Assessments:

Learners are required to perform supervised ultrasound scans with documentation in a logbook.

Unit Objectives

On completing this unit learners should be able to:

- Demonstrate detailed understanding of the relevant anatomy
- Understand the causes of pleural fluid in the clinical setting
- Demonstrate knowledge of ultrasound techniques associated with lung, pleural, and diaphragmatic pathologies.
- Understand the different techniques of ultrasound guided drainage and the advantages, disadvantages and different skill levels required for these techniques.
- Attain proficiency in ultrasound image optimisation in order to enable appropriate diagnosis
- Understand the limitations of ultrasound of the chest

Unit Content

The unit will present learners with the following material:

- Pleura and pleural space
- Chest Wall
- Lungs
- Pneumothorax
- Diaphragm
- Heart, Liver, Spleen, Kidneys
- Surface Landmarks of Thorax
- Diaphragm

The utility of thoracic ultrasound in:

- Pleural and diaphragmatic pathology
- Pleural thickening Collapse / consolidation
- Paralysed hemidiaphragm
- Hemothorax and empyema

Ultrasound techniques associated with:

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- Patient positioning
- Identifying normal lung movement via intercostal views.
- Pleural effusion, including the different echogenic patterns, recognising loculations and estimating the depth of fluid collection from the skin surface
- Pleural thickening and its differentiation from fluid
- Collapsed / consolidated lung and its differentiation from effusion
- The different techniques of ultrasound guided drainage (indirect v direct method) and the advantages, disadvantages and different skill levels required for these techniques.
- In general, the direct method with in plane visualization (i.e. with real time visualization of the needle throughout the procedure) should be reserved for those with greater experience and specific training in these techniques.

Limitations and Pitfalls

Understand the limitations of ultrasound of the chest

Teaching Methodologies

All units 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 1.5 hours shall be practical teaching. Stated times do not include the physics, artefacts and basic image optimization which should be provided if delegates are new to ultrasound.
- Learners will receive reference material covering the unit 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 delivery of the unit and course (they do not need to be present for the full duration of the course).
- The live scanning sessions for this unit shall include sufficient live patient models to ensure that each candidate has the opportunity to scan. Models will include normal subjects and patients with pleural effusions. If the latter are unavailable, suitable phantoms can be used. Practical procedures shall be taught on suitable phantoms..
- A post-test will be conducted at the end of the course that includes this unit as formative assessment.

Assessment and Logbook

- Evidence of satisfactory completion of training sessions.
- Evidence of assessment of competence (summative assessment) signed off by a suitably qualified assessor ((DDU, Radiologist, DMU or AMS or sonographer registered by NZ MRTB in the relevant field, CCPU in the relevant field or other qualification as approved by the CCPU Board).
- The original completed competence assessment form is to be sent to ASUM with the candidate's completed log book.
- Logbook requirements need to be completed, and logbooks need to be submitted within two years of completing a course.

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Formative Assessments

- *2* formative assessments (directly supervised with suggestions and advice provided during the scan)

Summative Assessment

- Summative assessment is to be performed by a suitably qualified assessor (see above) using the competence assessment form supplied at the end of this document (or equivalent if deemed sufficient by ASUM at their discretion).

Logbook Requirements

- Evidence of completion of logbook signed off by a suitably qualified supervisor (DDU, Radiologist, DMU or AMS or sonographer registered by NZ MRTB in the relevant field, CCPU in the relevant field or other qualification as approved by the CCPU Board).
- Logbook requirements need to be completed, and logbooks need to be submitted within 2 years of completing an accredited course.
- Perform 20 examinations, to be compared with other imaging or clinical / pathological findings and signed off by a suitably qualified supervisor (see above).
- At least 50% of examinations must be clinically indicated, and at least 5 must be positive.
- Candidates should perform 5 aspirations / tube insertions under supervision, using the indirect method for guidance.
- All cases must be compared with gold standard findings (such as comprehensive imaging, pathological findings or if these are unavailable then clinical course).
- Evidence of completion of logbook signed off by qualified supervisor (see above).
- At the discretion of the ASUM CCPU Certification Board candidates may be allowed an alternative mechanism to meet this practical requirement.

Minimal Imaging Sets

The following are proposed as minimal imaging sets for focused ultrasound examinations for the CCPU units. It is understood that in many cases more images should be recorded to fully demonstrate the abnormality. In some cases the patient's condition will not allow the full set to be obtained (e.g. in an unstable patient), in which case the clinician should record whatever images are obtainable during the time available to adequately answer the clinical question without allowing the ultrasound examination to interfere with ongoing medical treatment. If local protocols recommend more images for a particular examination then these should be adhered to.

- Longitudinal and transverse images of the effusion
- Images should include the costophrenic angle
- Chest wall depth and either depth to lung or effusion depth should be recorded

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ASUM CCPU Competence Assessment Form
Pleural Ultrasound

Candidate: _____

Assessor: _____

Date: _____

Assessment type: Formative (feedback & teaching given during assessment for education) ☐

Summative (prompting allowed but teaching not given during assessment) ☐

To pass the summative assessment, the candidate must pass all components listed

	Competent	Prompted	Fail
Prepare patient			
Position			
Informed			
Prepare Environment			
Lights dimmed if possible			
Probe & Preset Selection			
Can change transducer			
Understands roles of the different transducers			
Selects appropriate preset			
Discusses & justifies choice of probe orientation			
Understands effect of filters (e.g. THI & multibeam/crossbeam) on lung imaging			
Data Entry			
Enter patient details			

chest wall, ribs and costal cartilages, visceral and parietal pleura, pleural space, lungs, diaphragm, liver, spleen, and heart

Image Acquisition			
Optimisation (depth, freq, focus, gain)			
Images & explains normal structures			
Chest wall			
Ribs / costal cartilages			

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Pleural space			
Pleural sliding			
Able to use M mode & explain its role & limitations			
Lung			
Diaphragm			
Liver and spleen			
Heart			

Images & explains normal artefacts

Lung (pleural) sliding			
Identifies & explains the basis of common artefacts			
Scatter			
Lung curtain			

Interprets images of pathology (using library images if necessary)

Pleural thickening			
Pleural fluid			
Locally invasive disease (mesothelioma)			

Record Keeping

Labels & stores appropriate images			
Documents any pathology identified			
Completes report			
Each view adequate / inadequate			
Documents focussed scan only			
Describe findings briefly			
Integrates ultrasound findings with clinical assessment and explains how the findings might change management			

Machine Maintenance

Cleans / disinfects ultrasound probe			
Stores machine and probes safely and correctly			

For Formative Assessment Only:

*Feedback of particularly good areas:*_____

_____

_____

_____

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*Agreed actions for development:*_____

_____

_____

_____

Examiner Signature:_____ Candidate Signature:_____

Examiner Name:_____ Candidate Name:_____

Date:_____

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