

**Certificate in Clinician Performed Ultrasound
(CCPU)**

Syllabus

Renal Hydronephrosis & Calculi

Renal Hydronephrosis and Calculi Syllabus

Purpose:

This unit is designed to cover the theoretical and practical curriculum for renal hydronephrosis and calculi.

Prerequisites:

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

Training:

Recognised either through attendance at an ASUM accredited renal hydronephrosis and calculi course or equivalent.

Assessments:

Learners are required to provide evidence of satisfactory completion of training sessions, supervised ultrasound scans and documentation in a logbook.

Unit Objectives

On completing this unit learners should be able to demonstrate:

- Effective performance and interpretation of ultrasound of the kidneys and bladder for hydronephrosis and calculi.
- An understanding of the limitations of ultrasound of the kidney for hydronephrosis and calculi.

Unit Content

The unit will present learners with the following material:

Anatomy:

- Kidney and normal renal outline
- Cortex, pelvis, renal artery and vein
- Hepatorenal and splenorenal space
- Aorta
- Bladder
- Ureteric Jets and causes of asymmetrical ureteric jets
- Anatomic variations of collecting system (e.g. Extrarenal pelvis, duplex collecting systems)

Measurements:

- Accurate measurement of renal size
- Normal and causes of abnormal measurements (e.g. horseshoe kidney)
- The importance of aortic measurements in the setting of renal colic

Imaging:

- Imaging the kidneys in longitudinal and transverse planes
- Imaging the bladder in longitudinal and transverse planes and calculating bladder volume
- Imaging and accurately measuring the aorta
- Understand the limitations of ultrasound of the kidney for hydronephrosis and calculi

Hydronephrosis, calculi, and other pathologies:

- Relation of hydronephrosis and obstruction
- Causes of physiological hydronephrosis

- Normal echogenicity of adult and paediatric kidneys
- Appearance of calculi and other causes of calcification
- Limitations of ultrasound in the diagnosis of renal calculi
- The utility of bladder volume measurements for diagnosing retention and as a cause for recurrent UTI.
- Cysts
- Criteria for simple renal cysts
- Recognising simple renal cysts and distinguish from complex cysts and other renal masses.
- Cortical and parapelvic cysts

Techniques, Physical Principles and Safety:

- Appropriate transducers, artifacts, windows, standard images, image optimisation in the context of a Hydronephrosis scan.

Limitations and Pitfalls

Understand the limitations of ultrasound of the kidney for hydronephrosis and calculi.

Teaching Methodologies

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 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 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 will be present for at least part of 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. Given that it may be difficult to find subjects with sufficient pathology, it is appropriate to include a practical 'image interpretation' session in which candidates must interpret images of the relevant pathology.
- A post-test will be conducted at the end of the course 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.

Formative Assessments

- 2 formative assessments (directly assessed 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

- Logbook requirements need to be completed, and logbooks need to be submitted within 2 years of completing a training course.
- Complete 25 Renal scans, including 5 positive not necessarily directly supervised but 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 (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.)
- Summative assessment is to be performed by a suitably qualified assessor (see above) using the pro forma supplied at the end of this document (or equivalent if deemed sufficient by ASUM at their discretion). The original completed assessment is to be sent to ASUM with the candidate's completed log book.
- At the discretion of the ASUM CCPU Certification Board candidates may be allowed an alternative mechanism to meet this practical requirement.
- Those cases that involve a procedural component must be signed off by a suitable assessor who performs those procedures themselves

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.

For each kidney:

- Longitudinal midline
- Transverse superior, mid and inferior
- Bladder transverse (ideally including ureteric jets) and sagittal view
- Aorta as for AAA (may be omitted if patient <40 yrs)

ASUM CCPU Competence Assessment Form

Renal Hydronephrosis & Calculi 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			
	Selects appropriate transducer			
	Selects appropriate preset			
Data Entry				
	Enter patient details			
Image Acquisition				
	Optimisation (depth, freq, focus, gain)			
<i>Identifies</i>	Kidney Long (R & L)			
	Kidney orientation			
	Renal pelvis			
	Cortex			
	Renal vessels			
	Hepatorenal / Splenorenal space			
	Measures Renal size accurately			
	Kidney Trans (R&L)			
Pelvis				
Cortex				
Renal vessels				
<i>Describes</i>	Appearance of Kidney			
	Appearance of hydronephrosis			
	Appearance of Cysts			

Actions if other renal mass seen

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Identifies

Bladder (Trans & Long)

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Bladder Volume Measurement

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Ureteric jets

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Describes

Normal pre & post void volume

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Abnormalities of ureteric jets

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Aorta

(unless <40 yrs)

Measures Aorta accurately

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Artefacts

Identifies & explains the basis of common artefacts

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Record Keeping

Labels & stores appropriate images

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Documents any pathology identified

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Completes report

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Each view adequate / inadequate

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Documents focussed scan only

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Describe findings briefly

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Integrates ultrasound findings with clinical assessment and explains how the findings might change management

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Machine Maintenance

Cleans / disinfects ultrasound probe

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Stores machine and probes safely and correctly

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For Formative Assessment Only:

Feedback of particularly good areas: _____

Actions for development _____

Examiner Signature: _____ Candidate Signature: _____

Examiner Name: _____ Candidate Name: _____

Date: _____