Certificate in Clinician Performed Ultrasound (CCPU)

Syllabus

Renal Hydronephrosis & Calculi

Australasian Society for Ultrasound in Medicine
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ACN 001 679 161 ABN 64 001 679 161

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 Applied Physics in Ultrasound unit.

Course Objectives

On completing this course 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.

Course Content

The course 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

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- 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.

Training

- Recognised through attendance at an ASUM accredited Renal Hydronephrosis and Calculi course. (Please see the website for accredited providers)
- Evidence of the satisfactory completion of training course is required for unit award.

Teaching Methodologies for the Renal Hydronephrosis and Calculi courses

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 three (3) hours of teaching time of which at least two (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 to ensure the required learning objectives are met.

Assessments

- Two (2) formative assessments of clincial skills, specificially related to the assessment of the renal hydronephrosis and calculi
- One (1) summative assessment of clincial skills, specificially related to the assessment of the renal hydronephrosis and calculi

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All assessments are to be performed under the supervision of the Primary Clinical Supervisor using the competence assessment form supplied at the end of this document.

Please refer to section 8 of the CCPU Regulations for information regarding timing and exclusion of these assessments in the logbook.

Logbook Requirements

- Twenty-five (25) renal scans, including five (5) positives (demonstrating the above pathology)
- A maximum of 50% paediatric cases (14 years and under) may be included in the logbook. Record in the column provided.
- All scans must be clinically indicated
- All cases must be compared with gold standard findings (such as comprehensive imaging, pathological findings or if these are unavailable then clinical course)
- All logbook cases must be signed off by a suitably qualified supervisor (see section 6 of the CCPU Regulations)
- 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.

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)

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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)			
Identifies	**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			
Describes	Appearance of Kidney			
	Appearance of hydronephrosis			

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		Competent	Prompted	Fail
	Appearance of Cysts			
	Actions if other renal mass seen			
Identifies	**Bladder (Trans & Long)**			
	Bladder Volume Measurement			
	Ureteric jets			
Describes	Normal pre & post void volume			
	Abnormalities of ureteric jets			
Aorta	(unless <40 yrs)			
	Measures Aorta accurately			
Artefacts				
	Identifies & explains the basis of common artefacts			
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:*_____

_____

_____

*Agreed actions for development*_____

_____

_____

Examiner Signature:_____ Candidate Signature: _____

Examiner Name:_____ Candidate Name:_____

Date:_____

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