Certificate in Clinician Performed Ultrasound (CCPU) Syllabus

Interventional Endocrine

Australasian Society for Ultrasound in Medicine
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Interventional Endocrine Syllabus

Aim

The candidate demonstrates skill in obtaining valid and efficient ultrasound data and correlating the ultrasound data with other clinical and diagnostic information, in the assessment of the thyroid 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 Interventional Endocrine unit is relevant to Advanced surgical training or FRACS, advanced physician training or FRACP or equivalent.

CCPU candidates engaged in ultrasound assessment of patients in a PoCUS setting should have:

- enrolled in the CCPU
- reviewed ASUM Code of Conduct and Safety Policies
- completed the ASUM CCPU online physics tutorial quiz
- attended a CCPU accredited course

Learning objectives

The candidate can:

- describe the clinical questions, related to diseases of the thyroid, which may typically be addressed using focussed point of care ultrasound (PoCUS) 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 of the thyroid, parathyroid and related tissues, such as the structures of the neck, which is suitable to answer the clinical question, including any applicable measurements.
- demonstrate competency in performing ultrasound directed interventional procedures.
- 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 structural and anatomical changes that may result from previous treatments such as surgery, and the consequent changes in ultrasound appearances.
- describe the limitations of ultrasound in assessing the thyroid, parathyroid and related tissues in a PoCUS context.
- understand the requirement for monitoring of personal performance outcomes, particularly in regard to interventional procedures including non-diagnostic biopsy outcomes and complications such as infection and haematoma rates.
- demonstrate an understanding of the limitations of ultrasound imaging and of the importance of appreciating individual self-limitations depending on the practitioner's level of experience and expertise and knowing when to seek assistance or advice.
- 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 knowledge of the TI-RADS criteria for thyroid nodules
- 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.

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Ultrasound Directed Interventional Procedures:

- Demonstrate competency in performance of diagnostic interventional techniques particularly FNAB.
- Understand the limited role of core biopsy in the evaluation of specific subtypes of thyroid guidels.
- Demonstrate competency in the identification and biopsy of pathologic lymph nodes.
- Understand the role of thyroglobulin assay in the assessment of suspicious lymphadenopathy in the context of a previous thyroid cancer diagnosis.
- Be aware of the role of peri- and intraoperative ultrasound as an adjunct in the surgical exploration for difficult hyperparathyroidism cases and in the performance of minimal invasive parathyroidectomy.
- Understand the role of percutaneous biopsy in the management of parathyroid lesions and the use of PTH needle washout assays in this setting.

Expected standards of practice for the CCPU Interventional Endocrine Unit

Key clinical questions addressed in PoCUS contexts:

- Is there an identifiable lesion on ultrasound?
- Does the lesion correlate with a clinically palpable mass or the presenting signs/symptoms?
- Does the lesion correlate with a mass identifiable on other modalities?
- What are the measurements of the lesion/s?
- What are the sonographic characteristics of the lesion?
- Are there any other findings which may support a provisional diagnosis?
- Are there any other findings which may support another differential diagnosis which may explain the patient presentation?

Minimum expected ultrasound data acquisition/protocols:

Preparation

- Prepare clinical environment
- Prepare patient, including detailed explanation and informed consent
- Select and prepare ultrasound and ancillary equipment
- Enter patient data into ultrasound equipment

Image acquisition

- Acquire and optimise ultrasound images/data, in accord with the published protocols.
- Identify relevant anatomical features and landmarks.
- Continuous real-time imaging of the thyroid/parathyroid to include all relevant neck structures.
- Measurement of the maximal diameter of identified mass lesions in three orthogonal planes.
- Identify and respond to ultrasound artifacts, if required, to improve diagnostic quality of images/data.

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Minimal recorded images/ultrasound data

The following are the required minimal images to be recorded. The extent to which documented images are required, beyond the minimum, will be determined by the specific clinically indicated goal of the examination.

- Representative images to demonstrate general thyroid/parathyroid architecture.
- Images of regions of clinical, palpable or sonographic concern or interest must be documented and labelled with detail of distance from relevant landmark where possible.

Sonographic appearances of expected positive, negative and equivocal findings

- Describe ultrasound appearances using correct sonographic terminology according to published standards.
- Identify and describe conclusive findings, positive or negative.
- Identify limitations of examination or 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

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

Primary Supervisor

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

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 thyroid ultrasound is required:

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- Two (2) formative assessments of clinical skills, specifically related to the assessment of the thyroid.
- One (1) summative assessment of clinical skills, specifically related to the assessment of thyroid. The summative assessments must be undertaken after no less than 50% and then 90% of the clinical record log requirements for thyroid cases have been met.
- Please refer to the CCPU Regulations for specific timing requirements related to the completion of these assessments.

Logbook Requirements

For the CCPU interventional endocrine unit candidates must demonstrate, in their verified logbook, that they have personally performed:

- A minimum of 75 ultrasound scans of the thyroid, including:
  - At least 30 scans with a verified positive finding.
  - Twenty (20) needle interventions procedures of thyroid, parathyroid or lymph node lesions.
- All ultrasound scans must be clinically indicated and performed in a clinical environment.
- 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.
- Up to 50% of scans can be non-clinically indicated.
- All logbook scans must be real-time scans.
- Scans conducted on simulators cannot be included in the logbook

Resources/suggested learning activities

- CCPU Accredited Courses
- Clinical training
- ASUM Standards of practice documents
- Baskin HJ. Detection of recurrent papillary thyroid carcinoma by thyroglobulin assessment in the needle washout after fine-needle aspiration of suspicious lymph nodes. Thyroid 2004; 14(11):959-963.
- Brennan MF, Norton JA. Reoperation for persistent and recurrent hyperparathyroidism. Ann Surg 1985; 201(1):40-44.
- Duick, DS., Levine, RA., Lupo, MA (Eds.). Thyroid and Parathyroid Ultrasound and Ultrasound-Guided FNA. Fourth Editon. 2018. Springer International Publishing.
- Fish SA, Langer JE, Mandel SJ. Sonographic imaging of thyroid nodules and cervical lymph nodes. Endocrinol Metab Clin North Am 2008; 37(2):401-17, ix.
- Franklin N. Tessler, William D. Middleton, and Edward G. Grant. Thyroid Imaging Reporting and Data System (TI-RADS): Radiology 2018 287:1, 29-36
- Gharib H, Papini E, Garber JR, Duick DS, Harrell RM, Hegedüs L, Paschke R, Valcavi R, Vitti P; AACE/ACE/AME Task Force on Thyroid Nodules. American Association of Clinical Endocrinologists, American College of Endocrinology, and Associazione Medici Endocrinology, and Associazione Medici Endocrinologi Medical Guidelines for Clinical Practice for the Diagnosis and Management of Thyroid Nodules--2016 UPDATE. Endocr Pract. 2016 May;22(5):622-39.

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- Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, Pacini F, Randolph GW, Sawka AM, Schlumberger M, Schuff KG, Sherman SI, Sosa JA, Steward DL, Tuttle RM, Wartofsky L. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid. 2016 Jan;26(1):1-133
- Hoang JK, Lee WK, Lee M, Johnson D, Farrell S. US Features of thyroid malignancy: pearls and pitfalls. Radiographics 2007; 27(3):847-860.
- Low TH, Delbridge L, Sidhu S, Learoyd D, Robinson B, Roach P et al. Lymph node status influences follow-up thyroglobulin levels in papillary thyroid cancer. Ann Surg Oncol 2008; 15(10):2827-2832.
- Soon PS, Delbridge LW, Sywak MS, Barraclough BM, Edhouse P, Sidhu SB. Surgeon performed ultrasound facilitates minimally invasive parathyroidectomy by the focused lateral mini-incision approach. World J Surg 2008; 32(5):766-771

Maintenance of Competence for Recertification

Once full accreditation of a candidate has been obtained in relation to the Interventional Endocrine CCPU, demonstration of ongoing maintenance of competence will be required by documentation over every 5-year period of the following performance measures:

- Submission of a recertification logbook with Forty (40) scans including Ten (10) needle interventions over a 12-month period in the 24 months prior to the recertification deadline. as per the requirements listed in Clause 13 and Appendix 2 of the CCPU Regulations.
- Attendance or participation in at least one ultrasound teaching course every five (5) years.
- Record at least five (5) points of CPD relevant to the interventional endocrine unit per year.

Course Content and Teachers Methodology

Course Content

The course will present learners with the following material:

Quality Control and Safety:

- Understanding of requirement for regular monitoring and safety checks for ultrasound equipment.
- Monitoring of personal performance outcomes, particularly in regard to interventional procedures including non-diagnostic biopsy outcomes and complications such as infection and haematoma rates.
- Demonstrating an understanding of the limitations of ultrasound imaging and of the importance of appreciating individual self-limitations depending on the practitioner's level of experience and expertise and knowing when to seek assistance or advice.

Anatomy:

- Understand thyroid anatomy, normal dimensions of the thyroid in adults and children and its relationship to the trachea.
- Understand the embryology of thyroid and thymus.
- The location of the pyramidal lobe and the frequency with which it occurs.

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- Demonstrate the ability to calculate thyroid volume and knowledge of the normal mean thyroid volume in the adult.
- Understand the blood supply of the thyroid including the positions of the superior and inferior thyroid arteries as well as the superior, middle and inferior thyroid veins.
- Understand the anatomy of the strap muscles, sternocleidomastoid and longus colli muscle and relationships to the thyroid gland.
- Understand the relationship of the recurrent laryngeal nerves to the thyroid gland and inferior thyroid artery.
- Identify the oesophagus and understand its relationship to the thyroid and trachea.
- Knowledge of the carotid arteries and branches, internal jugular vein and tributaries.
- Understand the distribution of lymph nodes in the cervical region and the nomenclature used to label the lymph node compartments.
- Understand the usual locations of the parathyroid glands and their relationships to the recurrent laryngeal nerve and inferior thyroid artery and thymus.
- Understand the variations in parathyroid locations and the frequently encountered ectopic sites.
- Understand the dimensions and weight of a normal parathyroid gland.
- Identify and understand the anatomic relations of the major salivary glands.

Performance of Ultrasound Examination of the Cervical Region**:**

- Understand the indications and rationale for thyroid and parathyroid ultrasound.
- Demonstrate the optimal positioning of a patient for ultrasound examination of the neck.
- Demonstrate a system for a thorough examination of the vital cervical structures.
- Demonstrate manoeuvres which enhance the examination of poorly visualized regions in the neck.
- Demonstrate proficiency in correlating ultrasound images with clinical findings.
- Understand and demonstrate the benefits of Doppler examination and its relevance in thyroid and parathyroid pathology.

Sonographic Imaging Criteria of Thyroid Pathology:

- Identify the sonographic features of benign hyperplastic or colloid nodules and adenoma.
- Recognise the sonographic features of papillary thyroid carcinoma including vascularity and patterns of microcalcification.
- Understand the common distribution of lymph node metastases and recurrences in papillary thyroid cancer and the features of pathologic nodes on ultrasound.
- Understand the limitations of ultrasound and fine needle biopsy in the diagnosis of follicular carcinoma.
- Understand the sonographic features of medullary thyroid carcinoma and its association with the multiple endocrine neoplasia (MEN) type II syndromes.
- Understand the presentation of anaplastic thyroid carcinoma and the features and limitations of ultrasound examination in this disease.
- Understand the typical sonographic features of thyroid lymphoma.
- Understand the features which differentiate benign and malignant nodules including internal contents, echogenicity, halo, regularity of margin, calcification and vascular flow patterns.
- Understand the significance of thyroid isthmus thickness in diffuse thyroid conditions.
- Understand the sonographic features commonly encountered in subacute granulomatous thyroiditis (de Quervain's), autoimmune lymphocytic thyroiditis (Hashimoto's), and Graves' disease.

Sonographic Imaging Criteria of Parathyroid Pathology:

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- Understand the common presentations of primary hyperparathyroidism and the biochemical features of the disease.
- Understand the causes of primary hyperparathyroidism and frequency of adenoma, multiglandular disease and carcinoma.
- Demonstrate the typical locations and sonographic appearance of parathyroid adenoma.
- Understand the typical sonographic features of parathyroid carcinoma.
- Understand the common ectopic locations for parathyroid adenoma and techniques which can be employed to visualize these sites.
- Understand the role of ultrasound in the investigation of persistent or recurrent hyperparathyroidism including the features of graft-dependent disease.
- Understand the sonographic features of parathyroid glands in secondary hyperparathyroidism.
- Be aware of the normal and pathologic cervical structures which may produce false-positive results during neck sonography for parathyroid adenoma.
- Understand the sensitivity of ultrasound in parathyroid localization and the factors which influence accuracy.
- Understand the role of other imaging modalities in parathyroid localization and their role in facilitating minimally invasive surgery.

Ultrasound Directed Interventional Procedures:

- Demonstrate competency in performance of diagnostic interventional techniques namely FNAB.
- Understand the role of core biopsy in the evaluation of specific subtypes of thyroid nodules.
- Demonstrate competency in the identification and biopsy of pathologic lymph nodes.
- Understand the role of thyroglobulin assay in the assessment of suspicious lymphadenopathy.
- Be aware of the role of intraoperative ultrasound as an adjunct in the surgical exploration for difficult hyperparathyroidism cases.
- Understand the role of percutaneous biopsy in the management of parathyroid nodules and the use of PTH assay in this setting.

Teaching Methodologies for the CCPU Interventional Endocrine Unit

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 five and a half (5.5) hours of teaching time of which at least three (3) 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 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.

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ASUM CCPU Competence Formative Assessment Form

CCPU Interventional Endocrine Unit

Candidate: _____

Assessor: _____

Date: _____

Assessment type: Formative 1 (feedback & teaching given during assessment for education) ☐

Formative 2 feedback & teaching given during assessment for education) ☐

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				
	Thyroid gland			
	Trachea			
	Oesophagus			
	Carotid artery			
	Internal jugular vein			
	Strap muscles			
	Sterno-mastoid			
	Cervical lymph nodes			

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Describes appearance & pathology	Competent	Prompted	Fail
Thyroid nodules number			
size			
features			
Parathyroid adenomas			
size			
position			
Abnormal lymph nodes number			
level			
features			
Setup for US guided FNA			

Artefacts			
Identifies & explains the basis of common artefacts			

Record Keeping			
Abnormal lymph nodes			
number			
level			
features			
Set up for US guided FNA			
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*_____

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Examiner Signature:_____ Candidate Signature: _____

Examiner Name:_____Candidate Name:_____

Date:_____

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ASUM CCPU Competence Summative Assessment Form

CCPU Interventional Endocrine Unit

Candidate: _____

Assessor: _____

Date: _____

Assessment type: 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			
Thyroid gland			
Trachea			
Oesophagus			
Carotid artery			
Internal jugular vein			
Strap muscles			
Sterno-mastoid			
Cervical lymph nodes			

	Competent	Prompted	Fail
Describes appearance & pathology			
Thyroid nodules number			

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size			
features			
Parathyroid adenomas			
size			
position			
Abnormal lymph nodes number			
level			
features			
Setup for US guided FNA			

Artefacts

Identifies & explains the basis of common artefacts			

Record Keeping

Abnormal lymph nodes			
number			
level			
features			
Set up for US guided FNA			
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			

Supervisor Declaration

*Once the candidate has met the minimum assessment and logbook criteria, the supervisor may choose to recommend the candidate to the CCPU board for credentialing in Interventional Endocrine CCPU.

I _____(supervisor name) am satisfied that _____(candidate's name) has demonstrated the minimum requirement for competency in Interventional Endocrine on _____(date).

Supervisor Signature: _____

Candidate Signature: _____

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