QUT Health

# CLINICAL SUPERVISOR HANDBOOK

**CS60 Graduate Diploma in Medical Ultrasound**
School of Clinical Sciences, Faculty of Health

the university for the real world®

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# Welcome and introduction

Congratulations on your appointment as a Clinical Supervisor for a student undertaking the Graduate Diploma in Medical Ultrasound (CS60) at QUT.

Clinical supervisors play a pivotal role in the education and professional development of future sonographers. Acting as mentors, educators, and guides, supervisors provide essential support to students during their clinical learning journey. QUT recognises and values your contribution, acknowledging the time and expertise required to train competent and compassionate Accredited Medical Sonographers.

This handbook is designed to provide clear and concise guidance for you and your student, and includes:

- An overview of the Graduate Diploma in Medical Ultrasound
- Requirements of the clinical department to ensure students receive adequate and appropriate clinical exposure
- The necessary qualifications for clinical supervisors
- A summary of the QUT clinical assessment process, including competency evaluation

# Course Overview

The QUT Graduate Diploma in Medical Ultrasound is structured to align academic learning with real-world clinical practice. Unlike other accredited ultrasound programs, our units are not strictly segmented by clinical area. Instead, they are designed to develop students' technical and critical thinking skills across a range of sonographic examinations appropriate to their level of experience.

Each unit incorporates key foundational and clinical concepts, including scan techniques, anatomy, physiology, pathology, and professional attributes. The curriculum ensures that graduates possess a comprehensive understanding of medical ultrasound and its applications in enhancing patient outcomes.

The program can be completed over two years of part-time study. However, some students may elect to complete the course over three years, depending on their circumstances.

## Subject Guide and Course Progression

| *Semester 1 – Year 1* | *Key content* | *Assessments* |
|---|---|---|
| ***CSN025 – Principles of Medical Ultrasound*** | This foundational unit introduces the core physical principles of medical ultrasound, including wave propagation, tissue interaction, and the fundamentals of image formation.<br><br>This unit can also be completed through QUT's single-unit study pathway **before** entering the course and securing a clinical traineeship. | Written Exam<br><br>Workbook |
| ***CSN037 – Foundations of Ultrasound Imaging*** | This unit covers the essential professional and technical aspects of good sonographic practice, including image optimisation, scan protocols, | Written Exam<br><br>Online Discussion<br><br>Reflective Portfolio |

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| | ergonomic principles, and introductory content to understand the foundations of abdominal, gynaecological, obstetric, chest, and vascular ultrasound.<br><br>This unit can also be completed through QUT's single-unit study pathway **before** entering the course and securing a clinical traineeship. | |

| *Semester 2 – Year 1* | *Key content* | *Assessments* |
|---|---|---|
| ***CSN026 – Ultrasonic Examination 1*** | This unit develops ultrasound techniques and pathology across a broad range of anatomical regions typically encountered early in a student's clinical experience, including basic musculoskeletal (MSK), thyroid, scrotal, vascular (DVT/Cartoid), hepatobiliary, renal, and pelvic ultrasound. There is a strong emphasis on pathology recognition, image optimisation, and structured reporting. | Written Exam<br><br>Case Report |
| ***CSN033 – Medical Ultrasound Clinical Practice 1*** | The first clinical unit requires students to complete a series of clinically focused tasks and demonstrate competency in selected foundational areas. | Clinical Portfolio/Supervisor Assessment<br><br>Video case report (abdomen)<br><br>Clinical Practical Assessment<br><br>1. *Abdominal Scan October /November* |

| *Semester 1 – Year 2* | *Key content* | *Assessments* |
|---|---|---|
| ***CSN027 – Ultrasonic Examination 2*** | This unit covers breast ultrasound and associated imaging modalities, salivary glands, miscellaneous abdominal structures (including the appendix), and obstetric topics such as fetal cardiac assessment, multiple pregnancy, and third-trimester growth and well-being. | Written Exam<br><br>ePoster incl. Peer review<br><br>Imaging Viewing Interpretation |
| ***CSN028 – Advanced Ultrasound Topics 2*** | This unit covers more advanced vascular and MSK topics, including haemodynamics, arterial and venous studies, and a range of specialised MSK applications. | Written Exam<br><br>Case Review (Oral - short recorded video)<br><br>Workplace Exercise |

| *Semester 2 – Year 2* | *Key content* | *Assessments* |
|---|---|---|
| ***CSN029 – Advanced Ultrasound Topics*** | This unit focuses on advanced obstetric imaging (including first-trimester screening, invasive procedures, adv morphology), paediatric ultrasound (hip, spine, cranial, and abdominal) | Image and Request Form interpretation<br><br>Case Report incl. Peer Review |

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| | | Written Exam |
| ***CSN034 – Medical Ultrasound Clinical Practice 2*** | This capstone clinical unit assesses the student's competency across the full scope of general sonographic practice, including foundational and critical practice areas. | Clinical Portfolio/Supervisor Assessment<br><u>Clinical Practical Assessments</u><br>1. Morphology scan September<br>2. Final clinical assessment (end of semester 2) |

# Requirements of Clinical Departments

## Workload

To meet the clinical learning outcomes of the Graduate Diploma in Medical Ultrasound, students must engage in hands-on ultrasound scanning rather than observation-only experiences.

Students are expected to participate actively in ultrasound practice throughout the course. The minimum requirement is **three days per week (or equivalent**) of supervised, practical scanning within a clinical department. Scanning hours may be accumulated from the start of scanning practice, including before formal enrolment, and must continue to be logged via the student's clinical Portfolio throughout the course.

## Clinical environment

Students must have access to a **diverse range of ultrasound examinations and case types.** This includes routine examinations and specialised areas such as:

Abdominal
Obstetrics/Gynaecological
Small Parts
Musculoskeletal (MSK)
Vascular imaging
Paediatrics

If the student's primary clinical site does not perform one or more of these examinations, they may be required to arrange supplementary placements at other facilities — such as tertiary centres — to gain this experience. QUT's Work Integrated Learning (WIL) team can assist with providing insurance coverage for students undertaking external placements.

Students are responsible for organising these placements and ensuring adequate supervision is achieved.

## Student activities away from Clinical Departments

Most academic learning activities are conducted online via QUT's Canvas learning platform. However, the following in-person requirements apply:

- **Optional on-campus lecture blocks** (typically 3–4 days) held at the beginning of each semester. These blocks align with Orientation Week in QUT's academic calendar.
- **Mandatory clinical practical assessments** are conducted in Brisbane at scheduled times during the course. The approximate timing of these assessments is provided in the *Clinical Practice Unit – Competency Assessment* section.

# Requirements of Clinical Supervision

## Principal Clinical Supervisor

The Principal Clinical Supervisor must be a currently practising **Accredited Medical Sonographer (AMS)**, with recognised accreditation through the **Australian Sonographer Accreditation Registry (ASAR)**.

This role is central to the student's clinical development. The Principal Clinical Supervisor acts as a mentor, working closely with the student to support their preparation for clinical assessments and guide their overall competency development.

Throughout the course, the Principal Clinical Supervisor is required to complete formative and summative clinical assessments that evaluate the student's performance across technical, professional, and communication domains. At the completion of each clinical practice unit (CSN033 and CSN034) the principal supervisor is provided with a secure link to complete a summative assessment of your student's progress.

The Principal Supervisor is also responsible for verifying that the student has accrued the required **clinical training**, as documented in the **Clinical Portfolio**.

## Clinical Supervisor

QUT recognises that multiple individuals may supervise students during their clinical experience. Any clinical supervisor must hold appropriate qualifications (i.e., AMS with current ASAR registration).

For this handbook, the term clinical supervisor refers to either the Principal Clinical Supervisor or another suitably qualified Accredited Medical Sonographer.

The clinical supervisor must be physically present on-site during the student's scanning activities. Their primary role is to provide real-time support, feedback, and professional guidance as students progress in their clinical practice.

**For students in Medicare-designated rural or remote locations:**

Professional supervision must still be maintained. In situations where on-site supervision is not feasible, the Principal Clinical Supervisor (or a nominated supervising practitioner) must be readily contactable to discuss procedures during examinations. Supervision may be conducted via teleradiology, internet-

based communication, or telephone and should be appropriate to the student's level of experience and competency.

**The roles and responsibilities of the clinical supervisor include:**

- Ensure the student has access to a variety of clinical cases and adequate scanning opportunities.
- Support the student in maintaining an acceptable standard of scanning across all clinical activities.
- Be available on-site to assist with technical or procedural difficulties.
- Provide constructive feedback on the completeness, accuracy, and diagnostic quality of examinations.
- Encourage the development of strong written and verbal communication skills.
- Promote an understanding of patient-centred care and best practice in clinical interactions.
- Reinforce universal infection control protocols and professional workplace behaviour.
- Verify entries in the student's Clinical Portfolio, including training hours and examination logs.

# Clinical Practice Unit – Competency Assessment

The clinical practice component of the Graduate Diploma in Medical Ultrasound consists of two units:

- **CSN033 – Medical Ultrasound Clinical Practice 1**
- **CSN034 – Medical Ultrasound Clinical Practice 2**

These units are designed to integrate academic knowledge with real-world clinical experience. They assess the student's readiness to practise as a graduate sonographer through multiple evidence-based components.

Each clinical practice unit is graded on a satisfactory/unsatisfactory basis. To receive a satisfactory grade, students must complete a combination of university-based and supervisor-led assessments.

The assessment framework includes:

## Student Clinical Portfolio

Throughout the course, students are required to maintain a detailed Clinical Portfolio, which serves as a record of their professional development. It includes:

- **Documented clinical training experience:** Students must log the amount of supervised ultrasound training. These hours may include scanning before formal enrolment but must continue for the full course duration.

- **Record of examination types:** Students must demonstrate experience in the core scans listed as part of ASAR accreditation requirements. Note: Students are expected to continue documenting all examinations and hours, even after minimum requirements are met.

- **Reflective entries:** Students are encouraged to reflect on learning experiences, challenges, and skill development to promote critical thinking and self-assessment.

## Case Reports

Students must submit clinical case reports based on examinations they have performed during clinical experience. These reports include:

- A critical review of the examination performed
- Evaluation of the scan's diagnostic value and clinical utility
- Discussion of pathology or sonographic findings, as appropriate

The complexity and clinical depth of the case reports increase progressively throughout the course. The communication of these case reports encompasses several forms, including written, video, e-poster, and oral presentations.

## Practical Assessment

QUT conducts several direct clinical competency assessments on the students at various course stages to maintain a robust approach to assessing clinical competency. The type of examination and approximate timings are outlined in the table below.

| Assessment | Unit | When | Where | Graded |
|---|---|---|---|---|
| Abdominal Practical Exam[1] | CSN033 | 2nd Semester Year 1 (Oct/Nov) | PA Hospital (Brisbane) | Competent or Not yet competent |
| Morphology Exam[1] | CSN034 | 2nd Semester Year 2 (Aug/Sep) | Mater or Redcliffe Hospital (Brisbane) | Competent or Not yet competent |
| Final Clinical Assessment[2] | CSN034 | End of 2nd Semester Year 2 (Oct/Nov) | QUT Garden's Point (Brisbane) | Competent or Not yet competent |

1. Where possible, both the ***Abdominal and Morphology Assessments*** are conducted in the presence of two QUT assessors (one faculty and one industry representative), awarding the student an overall *competent* or *not yet competent* grade. Both examinations are performed on actual patients in a primary healthcare setting and are not simulated; a full adult abdominal examination and full morphology are to be performed.

   *Practical examinations are face-to-face assessments that take place on-site at designated locations; travel costs to attend these assessments are the responsibility of the student.*

If the student is deemed "not yet competent" and has demonstrated a reasonable level of technical skill during their assessment, an opportunity to be re-assessed before the end of the semester will be granted. Repeated assessments deemed not yet competent will require the student to recommence the unit the following year.

2. The **Final Clinical Assessment** is structured to allow each student to demonstrate clinical competency across a range of core graduate outcomes. The students will be assessed on their clinical understanding of patient history and presenting symptoms, image interpretation, clinical problem solving, patient care and communication skills, scanning and technical ability, time management, report writing, and overall knowledge of various essential elements of medical ultrasound.

*Note: Each student is provided with the assessor appraisal forms used for these assessments via the QUT Canvas site, and these forms are also available to supervisors. These forms provide a comprehensive overview of the elements evaluated during these assessments. We encourage students to utilise these forms in their workplace and perform several mock examinations in preparation for their formal assessment.*

## Supervisor's Assessment

**Formative Clinical Assessments**

To support regular engagement with supervisors and encourage reflective clinical development, students are required to complete a minimum of **eight** formative clinical assessments across the course — ideally **four per year**.

These assessments are student-led and designed to provide timely, constructive feedback during training. While not graded individually, all eight evaluations must be completed and included in the **Clinical Portfolio** for a student to be eligible for a satisfactory result in CSN034 – Medical Ultrasound Clinical Practice 2.

Each student must complete at least one formative assessment in each of the following areas:

- Adult or Paediatric Abdomen
- Female Pelvis (including transvaginal scanning)
- Small Parts (Breast, Thyroid, or Scrotum)
- Obstetrics (1st, 2nd, or 3rd trimester)
- Deep Vein Thrombosis (DVT)
- Carotid
- Musculoskeletal (any region)

Any clinical supervisor who holds a current and active **ASAR number** is eligible to complete these assessments. However, each completed form must also be submitted to the **nominated Principal Clinical Supervisor** to ensure oversight and consistency.

Students are encouraged to align their formative assessments with upcoming formal evaluations — such as the Abdominal, Morphology, or Final Clinical assessments.

**Summative Supervisor Assessments**

In addition to the formative process, a formal **Supervisor's Clinical Assessment** is conducted after each clinical practice unit (CSN033 and CSN034). These summative assessments contribute directly to the student's final result and are aligned with the **Professional Competency Framework for Sonographers**, as outlined by the **Australian Sonographer Accreditation Registry (ASAR)**.

QUT will provide a secure online link to the Principal Clinical Supervisor for completion of this assessment. Supervisors are asked to evaluate the student's competency across:

- The five **foundation units**
- The six **critical practice units** (as per ASAR course accreditation standards table below)

It is understood that clinical exposure varies across departments, and the assessment tool accommodates this by allowing supervisors to indicate whether students have had sufficient opportunity to demonstrate competency in specific areas.

To achieve a satisfactory result in **CSN034**, students must be assessed as *competent* in **all foundation units** and **at least five out of six critical practice units**.

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| Foundation Units of Competence | Unit 1 | Professional and Ethical Practitioner |
| | Unit 2 | Lifelong Learner |
| | Unit 3 | Safety and Risk Manager |
| | Unit 4 | Communicator and Collaborator |
| | Unit 5 | Sonographic Practitioner |
| Critical Practice Units of Competence | Unit 6 | Abdominal |
| | Unit 7 | Breast |
| | Unit 9 | Musculoskeletal |
| | Unit 10 | Obstetrics and Gynaecology |
| | Unit 12 | Superficial Parts |
| | Unit 13 | Vascular (General) |

*Standards for the Accreditation of Sonographer Courses*
https://www.asar.com.au/course-accreditation/course-accreditation-applications/

# Further Information

The QUT Medical Ultrasound course is a challenging endeavour that will require a significant commitment from your student. I aim to support all supervisors and students to the best of my ability throughout their time at QUT. If you have any further questions, please do not hesitate to contact me directly.

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# Appendix 1 – Academic unit syllabus*

*Subject to change

| Unit | Syllabus |
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| ***CSN025 – Principles of Medical Ultrasound*** | *Power, Intensity, and Tissue Interaction in Ultrasound*<br><br>Understanding the properties of power and intensity, their relation to the ultrasound beam, and the basics of sound-tissue interaction, including attenuation and refraction.<br><br>*Ultrasound Transducers and Pulse-Echo Imaging*<br><br>Introduction to the components of ultrasound transducers and the principles of pulse-echo imaging, including key factors like beam intensity and frequency.<br><br>*Beam Profile and Focusing Techniques in Ultrasound*<br><br>Exploration of the 3D beam profile, the impact of transducer design on image quality, and the basics of transmit and receive focusing techniques.<br><br>*Ultrasound Imaging Modes and Real-Time Imaging*<br><br>Overview of ultrasound imaging modes (A-mode, B-mode, M-mode), the concept of real-time imaging, and how adjustments like line density and depth affect frame rate.<br><br>*Resolution in Ultrasound Imaging*<br><br>Exploration of the types of resolution (axial, lateral, contrast, and temporal) and the ultrasound machine components that influence resolution.<br><br>*Acoustic Windows and Transducer Types*<br><br>Acoustic windows, transducer types (phased, linear, curved), and how these elements contribute to image formation and beam steering.<br><br>*Signal Pathways, Image Processing, and Beamforming*<br><br>Pre- and post-signal processing and its impact on image quality; modern beamforming techniques, such as parallel beamforming and plane wave imaging.<br><br>*Introduction to Doppler Ultrasound*<br><br>Introduction to Doppler ultrasound, including the Doppler equation, sample rate (PRF), and the fundamentals of colour, PW, and continuous wave Doppler.<br><br>*Harmonics and Biological Effects*<br><br>Exploration of some advanced techniques, including the different types of harmonic imaging. Knowledge of the potential for biological impacts of diagnostic ultrasound and application of mechanical and thermal indexes. |

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| | *Ultrasound Artifacts – Part 1*<br><br>Overview of the types of ultrasound artifacts. Attenuation artifacts (shadowing, enhancement, edge) and beam dimension artifacts (beam width, slice thickness).<br><br>*Ultrasound Artifacts – Part 2*<br><br>Beam path artifacts (reverberation, refraction, mirror, multipath), depth of origin artifacts (velocity, range ambiguity), and miscellaneous artifacts.<br><br>*Quality Control*<br><br>Overview of quality control in ultrasound systems, focusing on using test objects (phantoms) to evaluate resolution, calibration, beam profile, and image uniformity.<br><br>*Advanced Ultrasound Technologies*<br><br>Introduction to advanced ultrasound technologies, including contrast agents, elastography, 3D imaging, and advanced Doppler modes. |
| ***CSN037 Foundations of Ultrasound Imaging*** | *Introduction to Sonography and Foundational Concepts*<br><br>Overview of the sonographer's role, core sonographic practices, and key terminology, including scan planes and transducer movements.<br><br>*Sonographic Terminology and Image Optimisation*<br><br>Introduction to sonographic terms like echogenicity and echotexture, knowledge of transducer types, knobology and techniques for image optimisation and reporting.<br><br>*Ergonomics in Sonography*<br><br>Practical application of ergonomic principles and strategies to prevent musculoskeletal injuries.<br><br>*Introduction to Abdominal Ultrasound* – Part 1<br><br>A general approach to abdominal imaging, including tips and tricks for successful imaging. Basic imaging techniques, sonographic anatomy and acute ultrasound findings relevant to the pancreas and gallbladder<br><br>*Introduction to Abdominal Ultrasound* – Part 2<br><br>Liver anatomy, function, and sonographic assessment, emphasising technique and clinical implications.<br><br>*Introduction to Abdominal Ultrasound* – Part 3<br><br>Ultrasound of the renal tract and spleen: the anatomy, physiology, and sonographic assessment techniques including common congenital variants.<br><br>*Fundamentals of Gynaecological Ultrasound – Part 1*<br><br>Overview of female pelvic anatomy, embryology, and the dynamic sonographic appearances of the reproductive system, including IUD localisation.<br><br>*Scan Techniques and Informed Consent in Gynaecological Ultrasound*<br><br>Transabdominal, transvaginal, and transperineal imaging techniques, including informed consent and patient preparation content.<br><br>*First Trimester Ultrasound Assessment*<br><br>Foundational knowledge for first-trimester ultrasound, including scan techniques, normal appearances, and the assessment of early pregnancy complications.<br><br>*Obstetric Ultrasound – Second and Third Trimesters* |

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| | Techniques and key elements of second and third-trimester obstetric imaging, including biometry, maternal structure assessment, and amniotic fluid measurement.<br><br>*Specialised Ultrasound Techniques – Cardiac, Lung, and FAST Scans*<br><br>Introduction to cardiac, lung, and FAST scan techniques, including indications, anatomy, and sonographic appearances in each area.<br><br>*Ultrasound-guided procedures and Vascular Access*<br><br>Introduction to ultrasound-guided procedures, including needle visualisation techniques, basic venous anatomy, and infection control protocols. |
| ***CSN026 Ultrasonic Examination 1*** | *Introduction to Musculoskeletal Ultrasound*<br>Foundational knowledge of musculoskeletal (MSK) ultrasound, including key terminology and clinical indications. Introduction to sonographic features of common MSK conditions such as tendinitis, tendinosis, and enthesopathy. Scan technique fundamentals and image optimisation strategies.<br><br>*Thyroid Ultrasound*<br>Embryology, anatomy, and physiology of the thyroid gland. Scan techniques for diffuse and focal thyroid disease, including interpretation using the Thyroid Imaging Reporting and Data System (TI-RADS). Assessment of nodules, goitre, and thyroiditis.<br><br>*Scrotal Ultrasound*<br>Sonographic anatomy and embryology of the testes and scrotal contents. Assessment of common pathologies, including epididymitis, hydrocele, varicocele, torsion, and testicular tumours. Scan protocols for acute and chronic scrotal conditions.<br><br>*Carotid and DVT Ultrasound*<br>Scan techniques and anatomy relevant to carotid and lower limb venous ultrasound. Clinical indications for stroke risk assessment and deep vein thrombosis. Sonographic criteria for stenosis, thrombosis, and vessel patency.<br><br>*Gallbladder and Biliary Tree*<br>Evaluation of gallbladder wall thickening, sludge, and calculi. Recognition of biliary dilatation and obstructive patterns. Correlation with clinical presentations such as jaundice and right upper quadrant pain.<br><br>*Liver Ultrasound*<br>Assessment of diffuse liver disease, including steatosis, fibrosis, and cirrhosis. Identification of focal lesions and use of sonographic characteristics to differentiate benign from malignant features. Evaluation of portal hypertension and vascular anatomy.<br><br>*Renal, Spleen and Retroperitoneum*<br>Sonographic appearances of renal parenchymal disease, renal masses, and bladder pathology. Introduction to transplant kidney assessment. Basic evaluation of the spleen, aorta, IVC, and pancreas.<br><br>*Pathology of the Uterus, Cervix, and Vagina*<br>Common uterine pathologies including fibroids, adenomyosis, and endometrial abnormalities. Cervical and vaginal findings across the reproductive lifespan. Techniques for assessing deep infiltrating endometriosis.<br><br>*Pathology of the Ovaries and Adnexa*<br>Differentiation of common adnexal masses using the IOTA classification. Recognition of ovarian cysts, endometriomas, dermoids, and malignancy risk features. Overview of adnexal torsion and pelvic inflammatory disease.<br><br>*Postmenopausal and Postpartum Pelvis*<br>Assessment of the endometrium and adnexa in the postmenopausal patient. |

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| | Recognition of normal postpartum appearances and identification of complications such as retained products or infection.<br><br>*Morphology Scan – Technique and Checklist*<br>A systematic approach to second-trimester morphology scanning. Review of required planes, biometric measurements, and documentation standards. Emphasis on technique, image optimisation, and fetal anatomical survey. |
| ***CSN027 Ultrasonic Examination 2*** | *Salivary and Parathyroid Gland Ultrasound*<br>Anatomy and function of the parotid, submandibular, sublingual, and parathyroid glands. Scan techniques and identification of normal and pathological appearances including inflammation, masses, and calculi.<br><br>*Bowel and Appendix Ultrasound*<br>Sonographic techniques for evaluating the gastrointestinal tract, with emphasis on the appendix. Identification of conditions such as appendicitis, intussusception, and other inflammatory bowel diseases. Differentiation of small and large bowel pathology.<br><br>*Breast Ultrasound*<br>Breast anatomy and physiology. Techniques for breast scanning including correlation with mammography. Identification and differentiation of benign and malignant lesions. Assessment of axillary lymph nodes and breast implants.<br><br>*Assessment of the Cervix and Placenta*<br>Measurement techniques for assessing cervical length during pregnancy and evaluation of placental position and morphology. Identification of common placental variants and associated complications.<br><br>*Fetal Cardiac Ultrasound*<br>Basic fetal cardiac embryology and physiology. Standard scanning planes and techniques to assess fetal heart structure, rhythm, and function. Strategies to improve detection of congenital heart disease.<br><br>*Fetal Growth and Well-being*<br>Principles of fetal growth assessment using biometric parameters. Evaluation of amniotic fluid volume, placental function, and fetal well-being indicators, including fetal movements and Doppler studies.<br><br>*Obstetric Doppler – Techniques and Applications*<br>Fundamentals of obstetric Doppler ultrasound, including waveform interpretation and correlation with fetal growth and placental function. Clinical applications in high-risk pregnancies.<br><br>*Multiple Pregnancy*<br>Diagnosis and classification of multiple pregnancies using chorionicity and amnionicity. Sonographic monitoring of twin-specific complications, including twin-to-twin transfusion syndrome (TTTS), TAPS, and TRAP sequence.<br><br>*Image Viewing and Interpretation*<br>Development of interpretative skills related to sonographic images and associated clinical documentation. Integration of sonographic findings with referral information and clinical reasoning. |
| ***CSN028 Advanced Ultrasound Topics A*** | *Vascular Haemodynamics*<br><br>Key concepts influencing blood flow, including the relationship between pressure and resistance.<br><br>*Doppler basics, Colour and Pulse-Wave techniques* |

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| | Doppler basics, including the relationship between pressure gradients and velocity, the Doppler effect, and the Doppler equation. Colour and PW display information, aliasing, and waveform indexes.<br><br>*Imaging the Abdominal Vessels*<br><br>Anatomy and sonographic pathology of the abdominal arterial system, including key vessels.<br><br>*Peripheral Artery Disease (PAD)*<br><br>Anatomy of the upper and lower limb arteries. Techniques for imaging the upper and lower limb arteries, including practical examples.<br><br>*Venous Haemodynamics and Chronic Venous Insufficiency (CVI)*<br><br>Critical factors influencing venous flow, including the role of valves and pressure gradient. The role of ultrasound to assess venous insufficiency in both the deep and superficial venous systems.<br><br>*Surgical Options for Treating Arterial Disease and Haemodialysis*<br><br>Overview of essential surgical treatments for arterial disease, including endarterectomy, stents, and grafts.<br><br>*Shoulder Ultrasound*<br><br>Anatomy of the rotator cuff and its relationship with the shoulder joints. Correct shoulder positions and transducer placements to assess structures statically and dynamically. Common shoulder pathologies e.g. rotator cuff tears, shoulder bursitis, and impingement syndrome.<br><br>*Wrist Ultrasound*<br><br>Anatomy of the wrist, including both dorsal and palmar aspects. Sonographic features of conditions such as tenosynovitis, ganglion cysts, carpal tunnel syndrome, and neuromas.<br><br>*Elbow Ultrasound*<br><br>Anatomy of the elbow, focusing on structures commonly assessed with ultrasound, including the medial and lateral compartments, distal biceps tendon, elbow nerves, and olecranon bursa. Sonographic appearance of common elbow pathologies, such as common extensor and flexor tendinosis, olecranon bursitis, and nerve syndromes.<br><br>*Knee and Hip Ultrasound Examination*<br><br>Sonographic anatomy and identifying the sonographic appearance of common pathologies of the knee and hip.<br><br>*Hernia Ultrasound Examination*<br><br>Understanding the types of hernias and scan technique required for assessment of inguinal (indirect and direct), femoral, epigastric, umbilical, para-umbilical, Spigelian, incisional, post-operative, and sportsman's hernias. |
| ***CSN029 Advanced Ultrasound Topics B*** | *First Trimester Screening and Invasive Procedures: Screening for Aneuploidy*<br><br>First-trimester screening techniques for aneuploidy, including nuchal translucency measurement, the significance of these screening methods, their role in detecting chromosomal and structural anomalies, and the differences between non-invasive prenatal testing (NIPT) and invasive procedures like CVS and amniocentesis.<br><br>*Advanced Morphology – part 1* |

Chromosomal anomalies and syndromes advanced fetal morphology, with an emphasis on common chromosomal anomalies and syndromes.

*Advanced Morphology – Part 2*

Structural anomalies, their sonographic appearances, and the significance of a methodical approach to anomaly detection.

*Fetal Heart: Pathology*

Fetal cardiac pathology, including structural anomalies and common congenital heart defects (CHD).

*Paediatric Abdominal Ultrasound: Techniques and Applications*

Key anatomical relationships and common conditions include hypertrophic pyloric stenosis, cystic fibrosis-related changes, and biliary atresia. Ultrasound techniques for assessing the upper GI tract, pancreas, liver, kidneys, and pelvis, emphasising differential diagnoses.

*Paediatric Hip Ultrasound: Techniques, Pathology, and Clinical Applications*

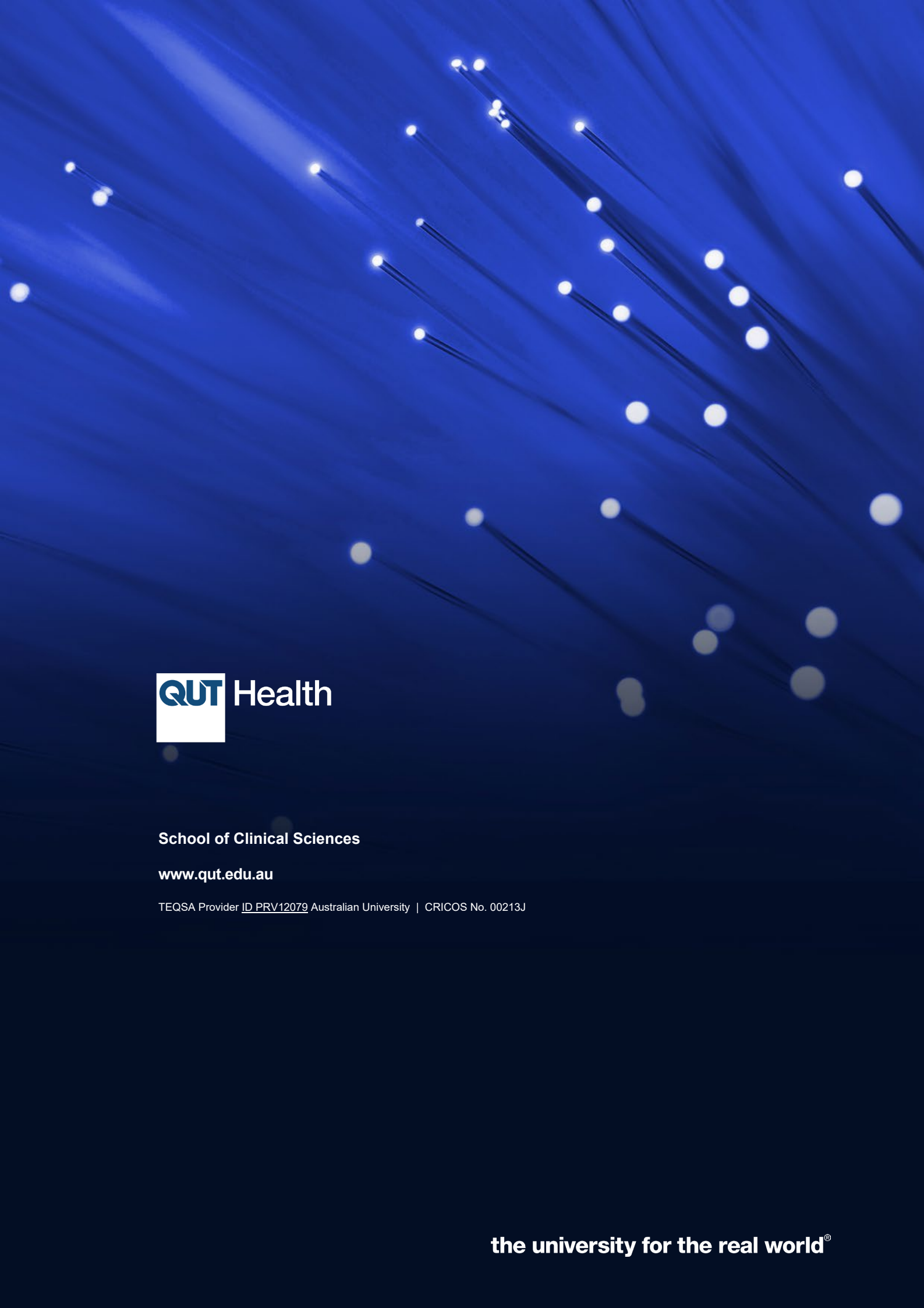
Developmental dysplasia of the hip (DDH), including its spectrum, risk factors, and treatment options. Evaluating a limping child, detailing sonographic techniques for assessing hip effusion, synovitis, and other differential diagnoses.

*Paediatric Cranial Ultrasound: Techniques, Pathology, and Clinical Implications*

Key imaging planes, measurement techniques for lateral ventricle size, and the identification of common intracranial pathologies such as intra-ventricular haemorrhage (IVH), hypoxic-ischaemic encephalopathy (HIE), and periventricular leukomalacia (PVL).

*Neonatal Spine Ultrasound: Techniques and Indications*

Scan technique, the embryological basis of spinal dysraphism, common indications for spinal ultrasound such as sacral dimples, hair tufts, skin tags, and haematomas.



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