Point of Care Ultrasound (1): Abdomen, Pelvis and Trauma Online Course

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Latest Review January 2025
Accreditation: RACGP (Activity Number: 926520) & ACRRM (Activity Number: 40071) for the 2026-2028 triennium

Learning Outcomes

At the completion of the course the participants should be able to:

1. Discriminate the ultrasound technique for imaging the abdominal aorta and ultrasound findings for abdominal aortic aneurysm.
2. Prioritise the role of point of care ultrasound in major trauma and distinguish the ultrasound findings for haemoperitoneum and haemopericardium
3. Differentiate the procedure for ultrasound of the lung in major trauma and the ultrasound findings in pneumothorax
4. Structure the ultrasound procedure, ultrasound anatomy and pathological findings in first trimester pregnancy
5. Outline how ultrasound may be used to assist insertion of a suprapubic catheter and obtain peripheral venous access

Summary of the e-Learning Program

The e-learning is interactive and requires the clinician to consider a series of blood gases and identify key abnormalities. The mastery quiz incorporates both formative and summative assessment components. There are 5 topics with a total course time of 8 hours.

The five topics are:

1. Abdominal Aorta
2. Ultrasound in Major Trauma (FAST)
3. The eFAST Protocol (Lung Ultrasound)
4. Ultrasound in the First Trimester
5. Procedures

Outline of the Program

1. Abdominal Aortic Aneurysm (AAA)

Module summary: Abdominal aortic aneurysm (AAA) is a common life threatening presentation to the emergency department. Signs and symptoms of leaking AAA are highly variable and the early signs are easily overlooked. CT scan while providing excellent images of the aorta may not be readily available (eg rural areas) and when available takes some time to complete and requires the patient to be transferred away from the resuscitation area. Ultrasound has the advantage of being able to performed rapidly (usually in a few minutes) and without the need to move the patient. In addition it has high sensitivity and specificity for AAA.

Interaction/Assessment:

- Video eTutorial: Introduction to Ultrasound of the Aorta
- Interactive Tutorial: Ultrasound of the Abdominal Aorta
- Topic Quiz – Module 1

2. Focused Assessment with Sonography in Trauma (FAST)

Module summary: FAST is a valuable tool for assisting with the diagnosis of the trauma patient and in particular aids the early recognition of intra-abdominal bleeding, haemothorax and pericardial fluid. The major benefit of the FAST scan is that it can be performed rapidly at the bedside, is non-invasive and obviates the need to move a potentially unstable patient to the CT. Research indicates that FAST can be performed by clinicians working in acute care with a high degree of accuracy.

Interaction/Assessment:

- Video eTutorial: The FAST exam
- Interactive Tutorial : FAST – Part 1
- Interactive Tutorial : FAT – Part 2
- Topic Quiz – Module 2

3. eFAST – Lung Ultrasound

Module summary: Ultrasound may be used to examine the lung to identify pneumothorax and pleural fluid. It is relatively easy to learn, non-invasive, rapid, repeatable and can be performed at the bedside. It is more sensitive and reliable than mobile CXR in the detection of pleural fluid and can detect as little as 100 ml. In this introduction to Lung Ultrasound we consider how lung ultrasound may be used in the Trauma patient to identify haemothorax and pneumothorax, two clinical findings that indicate serious chest injury and may be life threatening due to severe blood loss and /or respiratory failure. While we will take a deep dive into lung ultrasound in the POCUS (2) course, the following module will introduce you to how ultrasound can be used to image an air filled lung and the ultrasound findings associated with pneumothorax and pleural fluid. As this is quite a complex area of ultrasound it may be worth taking your time through this section. We will revisit and explore this topic further in POCUS (2).

Interaction/Assessment:

- Video eTutorial: Ultrasound of the Lung
- Interactive Tutorial : Ultrasound of the Lung
- Topic Quiz – Module 3

4. First Trimester Ultrasound

Module summary: Ultrasound may be used during the first trimester to identify the location of the pregnancy, determine gestation and identify abnormal IUP (pregnancy demise). In the first tutorial we examine the sonographic technique and ultrasound anatomy of the female pelvis. In the second tutorial we discuss the ultrasound findings associated with embryological development in early pregnancy, the measurements used for pregnancy dating and the ultrasound features of EARLY intrauterine pregnancy, LIVE intrauterine pregnancy, ABNORMAL intrauterine pregnancy and ECTOPIC pregnancy.

Interaction/Assessment:

- Video eTutorial: Ultrasound of the Pelvis
- Interactive Tutorial : First Trimester Ultrasound (1) – Technique / Anatomy
- Interactive Tutorial : First Trimester Ultrasound (2) – Embryogenesis, Ultrasound Diagnosis
- Topic Quiz – Module 4

5. Ultrasound Guided Procedures

Module summary: In this module we consider two of the major approaches that ultrasound may be used to assist procedures.

Ultrasound may be used in the first instance to identify the presence of a safe area for a blindly inserted needle. Examples here include pleurocentesis, paracentesis and suprapubic catheterisation. Here we are checking that the blind insertion of the needle is not likely to cause injury to vital structures such as lung or bowel. In this module we consider suprapubic catheterisation as an example.

Ultrasound may also be used to guide a needle into an anatomical area with the aim of avoiding vital structures. Examples include a wide variety of nerve blocks commonly used for providing local anaesthesia or to guide a catheter into a blood vessel to obtain peripheral vascular access or place an arterial or central venous catheter. In this module we explore the procedure for obtaining peripheral vascular access using ultrasound. We will explore this topic is greater detail in POCUS (2) where we revisit ultrasound guided peripheral venous access but consider in addition the anatomy and procedure for ultrasound guided central venous access.

Interaction/Assessment:

- Interactive Tutorial – Suprapubid Catheterisation of the Bladder
- Interactive Tutorial – Ultrasound assisted IV Cannulation
- Topic Quiz – Module 5

6. Final Post Course Assessment

Final Course Quiz – POCUS (1): Abdomen, Pelvis & Trauma