Thoracic Point-Of-Care Ultrasound Examination (TPOCUS)[1]

The Thoracic Point-Of-Care Ultrasound Examination (TPOCUS) is used to examine both sides of the thoracic cavity for the presence of **pneumothorax, pleural effusion** and **pericardial effusion**. A TPOCUS scan uses a combination of five acoustic windows. **Patient Preparation:** Patient stability at presentation will determine the extent of any preparation and the positioning for the exam.

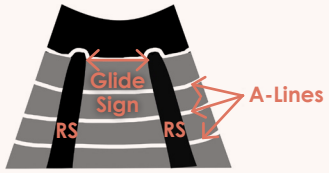
Ideally the examination is performed with the patient standing or in sternal position to allow any fluid to fall into the gravity-dependant parts of the thorax. » It is not necessary to clip the hair coat, although this can be performed depending on patient stability and in cases where the coat is long or thick. » Isopropyl alcohol is applied to the skin along with ultrasound gel. * » Use a micro-convex transducer. » Choose an abdominal preset. » The transducer marker should be orientated cranially. » Set the screen so that the left of the screen displays the marker side of the transducer i.e., the cranial aspect of the patient.

**After use, the transducer should be cleaned to remove any gross contamination and to avoid material drying on the casing. Use clean water and dry with a non-abrasive cloth or towel.*

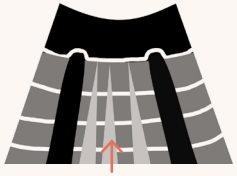
Chest Tube Site (CTS)

Performed on both sides of the thorax.

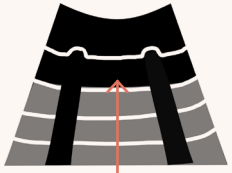
- Position the transducer perpendicular to the chest wall at the intercostal space of the most dorsolateral point
- Rather than making fanning motions, the transducer is held stationary at this point on the chest wall
- Use the ribs and their shadows (RS) as landmarks to identify the junction of the visceral and parietal pleura
- Normal aerated lung tissue causes reverberation artefact at the air-soft tissue interface (A-lines). This prevents visualisation deep to the pleural surface
- Look for the **glide sign** – the back-and-forth motion of the aerated lung sliding against the chest wall
- Be careful not to confuse the glide sign with the normal, horizontally orientated, equidistant A-line reverberation artefacts
- The glide sign can be observed when there is no chest wall, pleural space or pulmonary pathology present
- The glide sign is not observed where pneumothorax is present

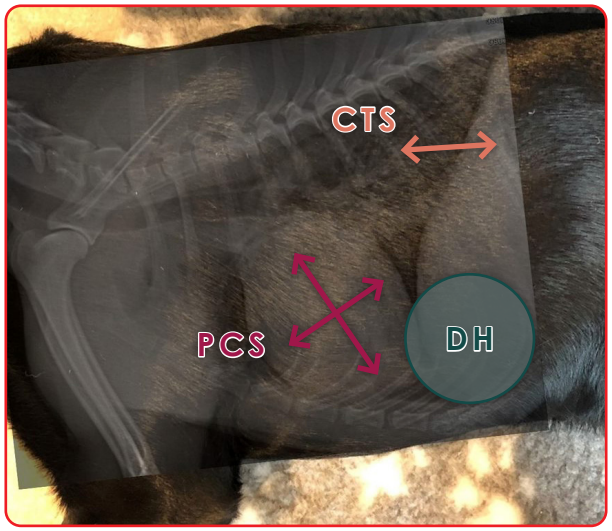


- If **pulmonary oedema or alveolar fluid** is present, multiple small reverberation artefacts may appear within the lung. These are known as B-lines or ultrasound lung rockets, and will obscure the A-lines. Isolated B-line artefacts can be seen in patients without respiratory disease



- If **pleural effusion** is present, anechoic fluid can be seen between the parietal pleura and lung surface



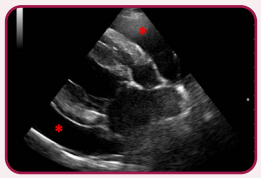


References: 1. Lisciandro G.R. (2011) Abdominal and thoracic focused assessment with sonography for trauma, triage, and monitoring in small animals. *Journal of Veterinary Emergency and Critical Care*. 21(2): 104-122

Pericardial Site (PCS)

Performed on both sides of the thorax.

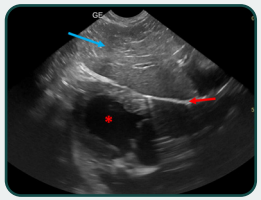
- Place the transducer caudal to the elbow, where the apex beat can be palpated
- The ventral thoracic cavity can be examined for pleural effusion and pericardial effusion
- When examining the right side of the chest, right sided parasternal long and short axis views of the heart can enable a rapid assessment of the cardiac chambers and heart muscle



Pericardial effusion
The pericardial space surrounding the heart is filled with anechoic fluid **(*)**.

Diaphragmaticohepatic View (DH)

- Place the transducer just caudal to the xiphisternum and angle cranially to view the liver
- Set the depth to identify the curved hyperechoic diaphragm – air interface and part of the thoracic cavity
- Fan the transducer towards the patient's right and left sides
- Assess this area of the pleural space for fluid accumulation and examine the heart for possible pericardial effusion



DH view in a normal dog
The liver is visible in the near field (blue arrow) and is adjacent to the curved, hyperechoic air-diaphragm interface (red arrow). Part of the thoracic cavity is visible and the left ventricle can be seen **(*)**.

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