

# EVALUATING THE THORAX

# Pulmonary auscultation

- Record inspiratory and expiratory respiratory pattern
- Auscultation of the lung is an important part of the respiratory examination and is helpful in diagnosing various respiratory disorders. Auscultation assesses airflow through the trachea-bronchial tree. It is important to distinguish normal respiratory sounds from abnormal ones for example crackles, wheezes, and pleural rub in order to make correct diagnosis.

- Examine the respiratory movements to ensure that there are no abnormalities.
- Measure the respiratory rate of the dog (number of breaths over 15 seconds X 4). Normal respiration rate for a dog is 10-30 respirations/minute.
- Auscultate the tracheal bifurcation at the level of the mid-thorax (8th intercostal space). Ensure the mouth is closed to prevent panting sounds.
- Auscultate sounds of the thorax dorsally, ventrally, cranioventral, craniodorsal and caudodorsally, as well as the trachea and larynx.

- Normal respiratory rates

<b>Species</b>	<b>Breaths /min (range)</b>
Cat	16–40
Dairy cow	26–50
Dog	18–34
Horse	10–14
Pig	32–58
Sheep	16–34

# NORMAL SOUNDS

## Trachea

Large air way sounds are normally sound

Sound like air moving through a large tube

Less turbulence

## Lungs

Lung sounds are soft

**Abnormal sounds are characterized as:**

- Crackles
- Wheezes
- Bronchial sounds

## Lung sound classification after the American Thoracic Society

	<i>Produced in</i>	<i>Cause</i>	<i>Example</i>	<i>Characteristics (pitch/amplitude)</i>
<b><i>Continuous sounds (inspiratory/expiratory)</i></b>				
Wheeze	Narrowed airways	Airway secretions, airway flutter	Asthma, bronchoconstriction	High/variable
Rhonchi	Large airway with rapid air movement	Large airway secretions	Bronchitis	Low/variable
Stridor	Upper airway Inspiratory	Turbulence/ obstruction	Upper respiratory tract (URT) paralysis, foreign body	High/variable
Stertor	Nasal/nasopharynx	Airway narrowing/ obstruction	Nasal foreign body, nasal tumour	Variable/variable
<b><i>Discontinuous sounds (inspiratory only)--were 'rales'</i></b>				
Crackles (fine)	Re-opening small airways	Fibrosis, lower airway disease	Asthma Westie lung	High/low
Crackles (coarse)	Re-opening larger airways	Obstruction, airway secretions	Bronchitis	Low/high

# Cardiac Auscultation

- **Major auscultatory findings include**
  - Heart sounds
  - Murmurs
  - Rubs



- **Heart sounds** are brief, transient sounds produced by valve opening and closure; they are divided into systolic and diastolic sounds.
- **Murmurs** are produced by blood flow turbulence and are more prolonged than heart sounds; they may be systolic, diastolic, or continuous. They are graded by intensity and are described by their location and when they occur within the cardiac cycle
- **Rubs** are high-pitched, scratchy sounds often with 2 or 3 separate components; during tachycardia, the sound may be almost continuous

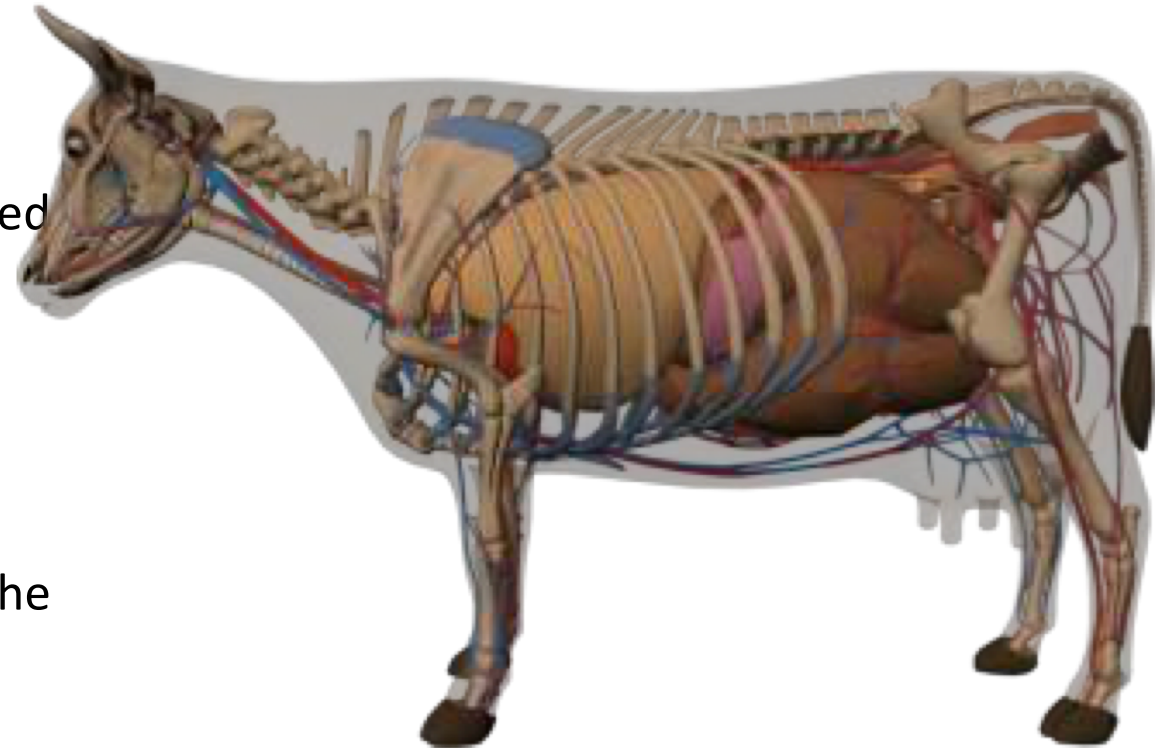
- In a normal dog or cat, two heart sounds are audible. The first heart sound (S1) is attributable to closure of the mitral and tricuspid valves at the onset of systole.
- The second heart sound (S2) is audible at the completion of ventricular systole and is attributable to closure of the aortic and pulmonic valves.
- Third and fourth heart sounds should not be appreciated in a normal dog or cat.

<i>Grade</i>	<i>Description</i>
I	Very soft murmur that is not immediately audible but can be heard only after careful auscultation in a quiet environment
II	Soft murmur that is audible with careful auscultation
III	Moderate murmur immediately audible with auscultation
IV	Loud murmur without a thrill
V	Loud murmur with a palpable thrill
VI	Audible with stethoscope held slightly off chest wall

- Heart sounds are best heard under the triceps/elbow between the 3rd and 5th intercostal spaces on the left side but can be heard on the right side
  - The heart sounds are difficult to hear but if the stethoscope is pushed far cranially, under the elbow, the heart sounds are audible
  - Usually heart sounds are loudest on the left side when the stethoscope head is completely hidden by the triceps mass
- The normal heart rate is 50 to 80 beats/minute



- Only the first two sounds heart sounds are heard
- • S1 the first heart sound is the loudest and is associated with the closure of the atrioventricular valves
- • It is loudest at the 4th intercostal space
- • S2 is heard shortly after S1 and is associated with the closure of the aortic and pulmonic valves
- • It is loudest at the 3rd intercostal space



# Arrhythmias

- Arrhythmias are disturbances in the normal heart rhythm
- Regularly irregular
  - Bradycardia
  - Tachycardia
  - Premature ventricular contractions located in a single foci
  - Sinus bradycardia

- Irregularly irregular
  - Atrial fibrillation
  - Paroxysmal supraventricular tachycardia
  - Ventricular tachycardia
  - Premature ventricular contractions
- In cattle arrhythmias are often associated with electrolyte imbalances
  - Hypokalemia