



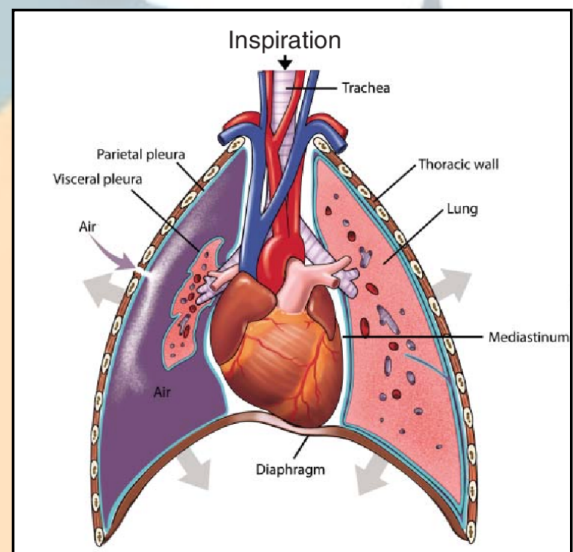
PNEUMOTHORAX IN DOGS AND CATS

What is a pneumothorax?

A pneumothorax occurs when **air accumulates within the chest cavity** (pleural space), **preventing the lungs from fully expanding**.

As air builds up:

- The lungs partially or completely collapse
- Breathing becomes difficult
- Oxygen levels fall
- Severe cases can become life-threatening



Common causes include:

- Trauma (hit by car, bite wounds, falls)
- Ruptured pulmonary bullae or blebs
- Penetrating chest injuries
- Lung tumors
- Surgical complications
- Severe pulmonary disease

While **some cases can be managed medically**, **many recurrent or severe pneumothoraces require surgery**. Modern thoracic surgery offers excellent outcomes, especially when the underlying cause can be identified and corrected.

What happens inside the chest?

Normally, the lungs remain inflated because the pleural space contains virtually no air.

When air enters the pleural space:

- Negative pressure is lost
- The lungs collapse
- Breathing becomes inefficient

The more air that accumulates, the more severe the lung collapse becomes.



Types of Pneumothorax

A) Traumatic Pneumothorax

Most common form.

Causes include:

- Road traffic accidents
- Dog bites
- Falls
- Penetrating wounds

B) Spontaneous Pneumothorax

Occurs without trauma.

Usually caused by:

- Pulmonary bullae
- Pulmonary blebs

These abnormal air-filled structures rupture and leak air into the chest.

C) Tension Pneumothorax

A life-threatening emergency.

Air enters the chest but cannot escape, causing progressive compression of:

- Lungs
- Heart
- Major blood vessels

Without immediate treatment, death may occur.

D) Open Pneumothorax

Air enters through a chest wall defect.

Commonly caused by penetrating injuries or severe bite wounds.

Clinical signs owners may notice

A) Mild cases:

- Increased respiratory rate
- Reduced exercise tolerance
- Mild lethargy

B) Moderate cases:

- Laboured breathing
- Anxiety
- Open-mouth breathing
- Reduced activity



C) Severe cases:

- Collapse
- Blue gums
- Severe respiratory distress
- Shock

Diagnosis

A) Physical Examination

Veterinarians often detect:

- Reduced lung sounds
- Increased breathing effort
- Abnormal chest sounds

B) Chest Radiographs

X-rays may reveal:

- Collapsed lung lobes
- Pleural air accumulation
- Pulmonary abnormalities
- Traumatic injuries



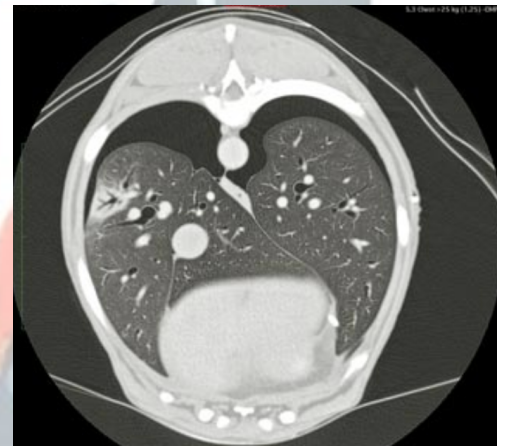
C) CT Scan

Particularly **important for spontaneous** pneumothorax.

CT scans help identify:

- Pulmonary blebs
- Pulmonary bullae
- Lung tumors
- Surgical targets

CT is strongly recommended before surgery whenever possible.



Emergency Treatment

A) Oxygen Therapy

Provides immediate respiratory support.

B) Thoracocentesis:

Air is removed using a needle and syringe.
Many patients experience rapid improvement.



C) Chest Tube Placement

Indicated when:

- Air reaccumulates rapidly
- Repeated drainage is required
- Surgery is planned

Chest tubes allow continuous evacuation of air from the pleural space.

Surgical Treatment

Surgery is recommended when:

- Air leakage persists
- Pneumothorax recurs
- Pulmonary bullae or blebs are identified
- Lung lobe rupture is present
- Chest wall defects require repair
- Lung tumors are involved

Lung Lobectomy

Gold Standard for Spontaneous Pneumothorax
Most spontaneous pneumothoraces arise from ruptured pulmonary bullae or blebs.
The affected lung lobe is surgically removed.
This procedure is called a lung lobectomy.

Why remove the entire lung lobe?

Bullae frequently involve large portions of the lung.
Removing the entire affected lobe:

- Eliminates diseased tissue
- Minimises recurrence
- Provides the most reliable long-term outcome

Stapled Lung Lobectomy

Most common technique. Your Specialist surgeon will use some advanced surgical equipment that can reliably achieve a seal and decrease the surgical time.

Surgical staplers simultaneously:

- Seal airways
- Seal blood vessels
- Remove the diseased lung lobe

Partial Lung Lobectomy

Used when lesions are:





- Small
- Localised
- Traumatic

In such case, only the affected part of the lobe is excised, leaving more ventilatory function available. This is particularly meaningful when the lung capacity was already compromised due to some previous surgeries.

Thoracoscopic Surgery (VATS)

Video-Assisted Thoracoscopic Surgery (VATS) uses:

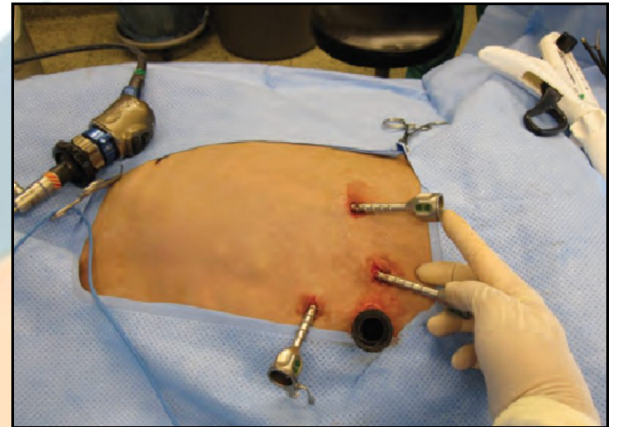
- Small incisions
- Specialised cameras
- Minimally invasive instruments

Advantages include:

- Less pain
- Faster recovery
- Smaller incisions
- Reduced hospitalisation

Disadvantages:

- Potentially longer surgery if the origin of the leak is not



Thoracotomy

Traditional open-chest surgery.

Advantages:

- Excellent exposure
- Complete exploration of the chest
- Access to all lung lobes

Still considered the standard approach for many spontaneous pneumothorax cases.

Sternotomy

Incision is done through the sternum rather than in between two ribs. This allows exploration of the entire chest, both left and right hemithoraces. Often required if the source of the air leakage cannot confidently be identified on the imaging.

Sternotomy carries a higher complication rate than thoracotomy, with more wound-related complications, infection, breakdown, delayed healing. It may require a slightly longer stay in hospital.

Outcomes and Prognosis

A) Traumatic Pneumothorax

Overall survival: 85–95%
Many animals recover without surgery.



B) Spontaneous Pneumothorax

Following surgery: 80–95% long-term survival

Recurrence rates are dramatically lower than with medical management alone.

For this reason, surgery is generally considered the treatment of choice.

Complications

Persistent air leak: 5–15%
Pneumonia: 5–10%
Pleural effusion <10%
Haemorrhage <5–10%
Arrhythmias 5–15%
Surgical site infection <5%
Recurrence after surgery 0–10%
Death related to surgery 0–10%

Most complications are manageable when identified early.

Recovery Timeline

Day 0:

- Diagnosis
- Stabilisation
- Thoracocentesis

Days 0–2:

- Chest tube management
- CT scan
- Surgical planning

Days 1–3:

- Surgery if indicated
- Hospitalisation can vary, typically would stay in hospital for 48h. More is there is mild residual production through the drain in the immediate recovery.

Week 1:

- Marked improvement in breathing

Weeks 2–4:

- Continued healing
- Restricted activity

Weeks 6–8:





- Return to normal activity in most patients

Bottom Line

Pneumothorax is a potentially life-threatening condition caused by air accumulation around the lungs.

While many traumatic cases respond to drainage and supportive care, spontaneous pneumothorax frequently requires surgery because recurrence is common if pulmonary bullae or blebs are not removed.

For most spontaneous cases, CT imaging followed by lung lobectomy remains the current gold-standard treatment.

With modern thoracic surgery, most dogs and cats can return to a normal and active quality of life.

