Differentiating primary cardiac disease from respiratory disease can be challenging in many clinical cases. Chronic airway disease and chronic valve disease are both common in older, small breed dogs, and may even exist concurrently in the same animal. In such cases, it can be difficult to determine the underlying cause of clinical signs.

Common presenting signs of heart disease include:
- Respiratory distress
- Coughing
- Ascites
- Syncope

**RESPIRATORY DISTRESS**

Important clues about the cause of respiratory distress can be obtained from the breathing pattern.

**Inspiratory effort with noise**
Upper airway obstruction

**Inspiratory and expiratory effort with no noise**
Pulmonary parenchymal disease (pulmonary oedema/heart failure; pulmonary haemorrhage, pneumonia)
Pleural disease (congestive heart failure, neoplasia, chylothorax, haemothorax)

**Expiratory effort**
Small airway disease (often with associated wheezing)

Thoracic radiography may be useful with pulmonary parenchymal disease; examination under anaesthesia will be useful with upper airway obstruction; bronchoscopy may be necessary with lower airway disease.

Additional signs associated with left-sided heart failure include:
- History of laboured breathing (± coughing in dogs)
- ↑ respiratory rate (> 40 breaths/min)
- Lung sounds may be normal if only interstitial edema present
- Quiet inspiratory crackles if alveolar edema present (i.e. only with severe pulmonary edema)
- Heart rate may be moderately elevated with no slowing in dogs (although note that bradycardia may develop in some terminal cases and frequently in cats with severe pulmonary oedema)
- ± concurrent signs of heart disease (murmur, arrhythmia, gallop sounds)
- Weight loss common with severe, advanced heart failure

**Radiographic features of left heart failure**
- LEFT ATRIAL ENLARGEMENT nearly always present with pulmonary edema (exceptions include endocarditis or ruptured chordae tendineae) – see below
- Pulmonary vessels may be wider than normal
- Pulmonary edema may be evident as hazy increase in radiodensity in hilar area
- Air bronchograms may not be obvious even with severe alveolar edema
- Cats may have patchy infiltrates, with left atrial enlargement more obvious on ventrodorsal view than lateral view

**COUGHING**

The type of coughing is less useful than the type of breathing. It is not always possible to determine if coughing is productive or not. Coughing is nearly always a sign of airway disease. If coughing is associated with heart disease, severe left atrial enlargement should be noted on radiographs. Note that coughing is very rarely associated with heart disease in cats.

**Additional signs associated with AIRWAY DISEASE**
- Coughing is usually the main clinical sign
- May have marked expiratory component in respiration with small airway disease
- Inspiratory crackles often loud when associated with airway disease/pulmonary fibrosis
- Heart rate often normal, with sinus arrhythmia in dogs
- Bodyweight usually maintained, and frequently overweight

**ASCITES**

Ascites caused by right heart failure is usually associated with jugular distension, caused by increased right atrial pressures. Note that cats may develop increased atrial pressures secondary to pleural effusions of non-cardiac origin.

**Right heart failure**
- Ascites
- Pleural effusion
- Jugular distension
### Summary

<table>
<thead>
<tr>
<th>Question</th>
<th>Signs of Heart Disease</th>
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<tbody>
<tr>
<td>Are there signs of heart disease?</td>
<td>murmur, arrhythmia, gallop sounds, cardiomegaly</td>
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<tr>
<td>If so, what are the likely causes?</td>
<td>Dogs: mitral regurgitation, dilated cardiomyopathy, pericardial effusions</td>
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<td></td>
<td>Cats: Hypertrophic cardiomyopathy, Functional murmurs (asymptomatic cats only)</td>
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<tr>
<td></td>
<td>Restrictive cardiomyopathy, Dilated cardiomyopathy</td>
</tr>
<tr>
<td>Are there any signs suggestive of congestive heart failure?</td>
<td>tachypnoea ± inspiratory crackles</td>
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<td>With coughing dogs, are there signs of left atrial enlargement on radiographs?</td>
<td>If not, the coughing is probably not due to cardiac disease</td>
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<tr>
<td>With pleural effusions in cats (modified transudates or chylothorax), are there other signs of cardiac disease?</td>
<td>ECG often abnormal with cardiac disease, Cardiomegaly generally present on radiographs, Echo diagnostic for cardiac disease</td>
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</tbody>
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