Diagnosing cardiac disease in dogs and cats can be challenging. Clinical signs may be absent or indistinguishable from those of other conditions, particularly respiratory disease. Physical examination findings may include a heart murmur, cardiac arrhythmia, respiratory distress, harsh or muffled lung sounds, weak pulses, etc., but these may be difficult to appreciate especially in a distressed, anxious or uncooperative patient. Thoracic radiographs may be difficult to interpret. Cardiac ultrasound, which usually requires referral to a specialist, is often necessary to fully characterise the disease. However, a cardiac biomarker, a substance that is released from the heart in increased amount when the heart is diseased, can be detected in the circulation. These markers can be used as part of the diagnostic workup of a patient to support the diagnosis of cardiac disease and help to distinguish cardiac from respiratory causes of dyspnea. They will also help guide you to make decisions about additional diagnostic testing and the need for referral and treatment.

Cardiac Disease in Dogs
Degenerative or chronic valvular disease (CVD) is the most common cardiac disease in dogs. In addition, dilated cardiomyopathy (DCM) is relatively common in some large-breed dogs. Dogs with CVD can be asymptomatic but usually have a murmur detected on routine physical examination. Dogs with DCM can also be asymptomatic and may or may not have a murmur or arrhythmia on physical examination. Alternatively, dogs with cardiac disease can present in congestive heart failure with clinical signs including coughing, dyspnea, weakness, exercise intolerance and collapse. The challenge is that the presence of a murmur or other evidence of heart disease in a dog presenting with clinical signs such as coughing and respiratory distress does not invariably mean that the clinical signs are a result of its cardiac disease. These signs may in fact be resulting from concurrent respiratory disease in the face of stable CVD or DCM. Introducing the measurement of cardiac biomarkers into the diagnostic workup of these patients can help to determine the significance of the cardiac disease and appropriate next steps.

Prevalence of Heart Disease
Cardiac disease is one of the most common disease states presented to the veterinarian. It has been estimated that up to 15% of dogs presented to a practice may show some signs of cardiac disease and this increases to over 40% in dogs older than 7 years of age. Because cats present with few if any signs of heart disease, disease prevalence has been less clear in cats. However, a recent study on cardiomyopathy in seemingly healthy cats suggests 16% of cats have heart disease.

Cardiac Disease in Cats
The challenge in cats with cardiac disease is somewhat different. Cardiomyopathies are the most common cardiac diseases in cats. Cardiac disease often remains clinically silent in cats until the disease process is well advanced. There may be subtle clues on physical examination that cardiac disease is present, such as a murmur or gallop rhythm, but the significance of these is often unclear without an extensive workup including an echocardiogram. Measuring cardiac biomarkers in cats will add valuable information and allow decisions to be made about the most effective next steps to evaluate feline patients. In addition, as with dogs, cardiac biomarkers can be useful to determine if signs of respiratory distress are likely the result of primary cardiac or respiratory disease.

What Is the Cardiopet proBNP Test?
The Cardiopet proBNP Test measures the circulating levels of NTproBNP B-type or brain natriuretic peptide (BNP) is a member of a family of hormones that are released by the myocardium in response to increased stretch. The action of these hormones is to counter mechanisms that promote volume expansion causing myocardial stretch. The primary effect is to promote naturesis (sodium and water loss); hence the name. Like many peptide hormones, they are produced as large inactive precursor molecules known as prohormones. Upon release, the prohormone is cleaved into the active hormone (the C-terminal portion of the molecule), and NTproBNP (an inactive N-terminal portion of the molecule). The body has many systems for eliminating the active BNP and thus controlling its action. The half-life is therefore short (in the order of seconds), making it labile and difficult to measure. Conversely the inactive NT portion is not as labile, and thus, it is an easier molecule to measure. Because the Cardiopet proBNP Test measures the cardiac biomarker NTproBNP, it provides a valuable evaluation tool for cardiac disease.
When Should I Use Cardiopet proBNP to Evaluate My Patient?

The answer to this question varies by disease and by species. NTproBNP levels increase as cardiac disease worsens. Studies have shown that NTproBNP is useful in the following scenarios:

- **To differentiate heart disease from respiratory disease in both dogs and cats**
  A number of studies have been published to show that NTproBNP can be used to evaluate patients with respiratory signs and correctly identify the underlying cause as either cardiac or respiratory. The sensitivity and specificity for the test are typically in the 80s or low 90s depending on the investigator, species and study methodology. In cats, NTproBNP has been reported to have a 94% sensitivity, 86% specificity, 91.4% positive predictive value and 90.5% negative predictive value for differentiating cardiac from respiratory causes of dyspnea. The answer to this question varies by disease and by species.

- **To identify cats with occult cardiomyopathy**
  NTproBNP is very useful in detecting the presence of cardiac disease in cats without overt clinical signs. The marker is capable of doing this with a reported sensitivity of 90% and a specificity of 85%. In one study that reported the sensitivity of NTproBNP as 100%, all cats with a marker level of >99 pmol/L had echocardiographic evidence of cardiac disease. Studies are underway to assess the utility of NTproBNP in dogs with occult cardiomyopathy.

- **To stage disease and monitor progression**
  NTproBNP levels do increase with the severity of heart disease. Retrospective studies suggest that NTproBNP levels can predict the likelihood of a patient to go into congestive heart failure. Prospective studies are ongoing to further quantify the NTproBNP response and to develop guidelines for its use in this way. Another utility is still being investigated:

- **To assess a patient’s response to therapy**
  There has been speculation that NTproBNP can be used to assess response to therapy. To date, no one has proven utility for monitoring, but several studies are ongoing to explore the use of the marker in this way.

Start ordering Cardiopet proBNP today: For more information on how to get started using Cardiopet proBNP please call Customer Service on 1300 44 33 99. After you’ve received your test results, our experienced pathologists are always available for complimentary consultation. Go to www.idexx.com/probnp for more information.

Using Cardiopet ProBNP in Your Practice

The Cardiopet ProBNP Test is recommended for the following indications:

<table>
<thead>
<tr>
<th>Indication</th>
<th>Dogs</th>
<th>Cats</th>
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<tr>
<td>Assess patients with signs of heart disease³</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Detect occult disease³ (likely in high-risk dogs, but unproven)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Assess patients with signs of heart failure³</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Differentiate cardiac vs. respiratory disease³</td>
<td>✓</td>
<td>✓</td>
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Order the Cardiopet proBNP Test with Your Routine Chemistry/CBC Panel

The Cardiopet proBNP Test is a quantitative first-line test that can be ordered as a stand-alone test or with your routine chemistry/CBC panel. As part of the preliminary workup, the test can help you diagnose or rule out heart disease and support your recommendation for further diagnostic testing, which could include a radiograph, ECG or echocardiogram.

Specimen Requirements: Special PINK-TOP tube required. To request pink-top tubes, please call 1300 4 IDEXX (1300 44 33 99).

References


The information contained herein is intended to provide general guidance only. As with any diagnosis or treatment, you should use clinical discretion with each patient based on a complete evaluation of the patient, including history, physical presentation and complete laboratory data. With respect to any drug therapy or monitoring program, you should refer to product inserts for a complete description of dosages, indications, interactions and cautions.