ANTECH recently announced the availability of its Cardio-BNP test, a new canine-specific ELISA that measures the concentration of B-type natriuretic peptide (BNP) in a patient’s blood. BNP is a hormone released from the heart in increased amounts in response to myocardial stretch or hypoxia.

When combined with other clinical information, the ANTECH Cardio-BNP test accurately supports or excludes the diagnosis of congestive heart failure (CHF) in dogs and aids in assessing the severity of disease in cardiac patients. In a recent study\(^1\), a cut-off BNP value of 6pg/ml was found to be 90% sensitive and 78% specific for diagnosing CHF in dogs with cough or dyspnea; a second study of dyspneic dogs\(^2\) found that the same cut-off was 93% sensitive and 87% specific for diagnosing CHF.

**Indications for ANTECH™ Cardio-BNP test**

Consider the ANTECH Cardio-BNP for patients presenting with clinical signs including cough, dyspnea, lethargy or exercise intolerance; or subclinical signs such as heart murmur or arrhythmia. ANTECH Cardio-BNP results can be particularly helpful in situations where a thoracic radiograph is difficult to obtain (due to clinical instability) or difficult to interpret due to anatomic conformation.

The Cardio-BNP assay requires the new ANTECH Cardio-BNP grey-top tube. A 10-tube supply is recommended for a typical 2-doctor hospital. To order Cardio-BNP tubes, please contact ANTECH Customer Service and request item BNPTUBE-C.

**For your reference**

- ANTECH CardiocBNP Overview
- ANTECH CardiocBNP FAQ
- ANTECH CardiocBNP Specimen Protocol

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From Our Experts:

**Interview with Alan Spier, DVM, PhD, DACVIM (C)**

Blue Pearl Veterinary Partners

Q: How does the availability of cardiac biomarker blood tests like ANTECH’s new Cardio-BNP assay change the diagnostic workflow you recommend for patients with suspected heart disease?

A: I always recommend a chest x-ray as the first step in working up any animal that is suspected of having heart disease. The primary exception to this rule would be a cat with a murmur—an echocardiogram often makes more sense as a first step in that situation. But after the physical exam, a chest X-ray is the best screening tool for heart disease.

The algorithm for additional diagnostics including the BNP assay depends on the chest x-ray findings:

- **Clearly Normal Result:**
  - Additional diagnostics are not necessarily indicated, but a BNP test and echocardiogram can be useful to establish baseline values
  - Run routine bloodwork and blood pressure to identify concurrent disease that may impact the need/risk of cardiac therapy (hypertension, kidney disease, protein-losing nephropathy, etc.)
  - Cardiac therapy is generally not indicated in these patients

- **Indeterminate Result:**
  - Additional diagnostics (BNP and echocardiogram) are indicated to help differentiate cardiac from respiratory disease
  - Run routine bloodwork and blood pressure to identify concurrent disease that may impact the need/risk of cardiac therapy (hypertension, kidney disease, protein-losing nephropathy, etc.)
  - Unless the patient is critical or in respiratory distress, cardiac therapy should be reserved until a definitive diagnosis can be established

- **Obvious Evidence of Heart Disease:**
  - Ideally perform an echocardiogram to establish extent/severity of disease
  - Consider BNP assay if CHF is a concern; serial testing may also be of value
  - Run routine bloodwork and blood pressure to identify concurrent disease that may impact the need/risk of cardiac therapy (hypertension, kidney disease, protein-losing nephropathy, etc.)
  - Cardiac therapy is indicated in patients with CHF; in the absence of heart failure treatment is often controversial. Use results of echocardiogram and ACVIM Consensus guidelines (see next section) to guide therapy. Consultation with a cardiologist is recommended when contemplating cardiac therapy prior to the onset of heart failure.

The availability of the BNP assay in combination with traditional tools like thoracic radiographs will increase our diagnostic accuracy, particularly when the radiograph yields an indeterminate result. I think a nice secondary benefit...
of the BNP assay will be improved compliance from pet owners in getting recommended echocardiograms performed -- if their veterinarian shows them an elevated BNP level as evidence of heart failure, they will see greater urgency.

Q: How can the ANTECH Consult Line help in suspected cardiac cases?
A: Clients typically call us when they have already run the diagnostics – the chest x-ray, echocardiogram, etc. We help them distill the diagnostic information into action; that is, how to interpret the results, whether or not treatment is warranted, and the recommended treatment if therapy is indicated. We can guide clients through specific issues like when to start the patient on an ACE inhibitor, and how to differentiate pulmonary and cardiac disease.

Q: The 2009 ACVIM Consensus Statement, “Guidelines for the Diagnosis and Treatment of Canine Chronic Valvular Heart Disease”, has proven helpful to general practitioners to categorize the patient once heart disease has been diagnosed. Can you summarize some salient points from the Consensus?
A: Most importantly, the Statement maps patients into straightforward, actionable categories or stages of heart disease from A to D to guide selection of additional diagnostics and recommended therapies. The table below is a highly simplified summary describing the categories and recommended therapies – I strongly recommend downloading the statement in its entirety.

Clinical Reference:
Recommended Treatment by Heart Disease Severity
Contributed by Alan Spier, DVM, PhD, DACVIM(C)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description &amp; Examples</th>
<th>Recommended Treatment &amp; Nutrition (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Patients at high risk for heart disease but without heart disease currently evident</td>
<td>No treatment indicated</td>
</tr>
<tr>
<td></td>
<td><strong>At-risk animals:</strong> Dobermans, Cavaliers, Boxers</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Heart disease exists – patients are asymptomatic and no remodeling (cardiac enlargement) is evident</td>
<td>No drug or dietary treatment indicated</td>
</tr>
<tr>
<td></td>
<td><strong>Example:</strong> Mitral valve disease (MVD) without cardiac enlargement</td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>Heart disease exists – patients are asymptomatic for heart failure but cardiomegaly is evident</td>
<td>Treatment controversial. ACEI, β-blockers, spironolactone, pimobendin, amiodipine, diet</td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> Occult dilated cardiomyopathy (DCM), MVD with LV/RA enlargement or pulmonary hypertension</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Heart disease with congestive heart failure</td>
<td>Cardiac therapy: Lasix, ACEI, Pimobendin, diet +/- oxygen supplementation, spironolactone, β-blockers</td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> MVD or DCM with pulmonary edema, ascites or pleural effusion</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Refractory/complicated congestive heart failure</td>
<td>Cardiac therapy as for “C”, plus:</td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> CHF with atrial fibrillation, systemic hypotension (shock), pulmonary hypertension, or CHF refractory to standard diuretic doses</td>
<td>– Other diuretics (hydralazine)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Heart rate control (digoxin, β-blockers, diltiazem)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Vasodilators (Norvasc, hydroalazine, Viagra)</td>
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<tr>
<td></td>
<td></td>
<td>– Inotropes (dobutamine, dopamine)</td>
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</tbody>
</table>

Did you know:
Antech Imaging Services (AIS) provides remote ECG services through both a transtelephonic system and direct upload to the Antech Imaging Services website. Data is automatically and immediately routed to the first available cardiologist. Our cardiologists are boarded with 85 years of combined experience. ECG reads are currently available from 6am to 4pm PST.

Fees:
• Routine ECG interpretation: $35
• STAT ECG (verbal in 30 minutes, written in 2 hours): $60

Our AIS Cardiologists:
• Dr. Jean Betkowski DACVIM (C)
• Dr. Joel Edwards DACVIM (C)
• Dr. Dan Ohad DACVIM (C)
• Dr. John Reed DACVIM (C)
• Dr. Alan Spier DACVIM (C)
Click [here](#) to download the complete ACVIM Consensus Statement, "Guidelines for the Diagnosis and Treatment of Canine Chronic Valvular Disease".

If you have a specific question for Dr. Spier, please [click here](#) to submit it. Please include your contact information so we can get back to you promptly.

### Relevant Research:

**Abstract:** Comparison of the Diagnostic Accuracy of Thoracic Radiographs and Plasma Brain Natriuretic Peptide for Congestive Heart Failure in Dogs Presenting with Cough or Dyspnea

Schmitt KE, DeFrancesco TC, Klein AL, Atkins CE, Keene BW, Department of Clinical Sciences, North Carolina State University, College of Veterinary Medicine, Raleigh, NC

**Objective:** To compare the sensitivity and specificity of plasma brain natriuretic peptide (BNP) and a veterinarian's interpretation of thoracic radiographs (TXRs) for the diagnosis of congestive heart failure (CHF).

**Procedure:** TXRs from 15 dogs presenting for cough or dyspnea were interpreted by 30 veterinary practitioners of various types of clinical practice: general practitioners, emergency practitioners, board-certified specialists (radiologists, internists, cardiologists and intensivists). BNP was measured in study dogs by a validated canine ELISA. The cause of cough or dyspnea was determined as being due to CHF or non-cardiac by BNP-blinded review of the entire medical record, response to therapy, and necropsy (gold standard). Practitioners were asked how certain they were, based solely on their interpretation of the TXRs and signalment, that the patient’s clinical complaint of cough or dyspnea was the result of CHF. Sensitivity and specificity were calculated for BNP and practitioner accuracy in TXR interpretation. Fisher's Exact Tests were used to compare the proportion of animals correctly diagnosed with CHF by BNP and TXRs interpretation.

**Results:** BNP was superior to a clinician’s interpretation of TXR for the diagnosis of CHF (p=0.0002). When the clinicians were 80% confident of their TXR interpretation, sensitivity and specificity of TXR interpretation was 48% and 44%, respectively. BNP was 89% sensitive and 100% specific.

**Conclusion:** The accuracy of the diagnosis of CHF in dogs presenting with cough or dyspnea would be significantly enhanced in all types of clinical practice by the addition of a point-of-care BNP assay to the conventional diagnostic evaluation.

**ANTECH Take-Away:**

While the ANTECH® Cardio-BNP is not available as a point-of-care assay, its rapid turnaround (24 hours or less) makes it a valuable tool to confirm or rule out congestive heart failure in acute cases where dogs present with cough or dyspnea.

Feature:

**Radiographic evaluation of congestive heart failure, and the advantage of the concomitant utilization of ANTECH® Cardio-BNP canine**

Phillip Steyn, BVSc, MS, Diplomate American College of Veterinary Radiology Chief Radiologist and Director of Professional Services, ANTECH Imaging Services

Congestive heart failure (CHF) is a common malady that affects canines of all breeds and sizes. The radiographic changes associated with CHF often follow a chronological order: normal thoracic radiographs, individual chamber enlargement, pulmonary venous engorgement, perihilar cardiogenic pulmonary edema, generalized cardiogenic pulmonary edema, and pleural effusion.

One of the most salient radiographic changes associated with CHF is pulmonary edema, which is visualized as on thoracic radiographs as alveolar pulmonary infiltrates, with resultant increased opacity, loss of vascular detail and air bronchogram formation. However, cardiogenic pulmonary edema is not the only cause of alveolar pulmonary infiltrates. Other differentials to consider for alveolar pulmonary infiltrates include:

1. Noncardiogenic pulmonary edema (e.g., post head trauma, post-seizure, electric shock, smoke inhalation, ARDS, uremia, pancreatitis, acute upper airway obstruction, anaphylaxis/severe allergic reactions, altered capillary permeability);
2. Multilobar bronchopneumonia;
3. Atypical bronchopneumonia;
4. Pulmonary contusions;
5. Intra-pulmonary hemorrhage;
6. Pulmonary thromboembolic disease.

Radiographic evaluation alone is not always adequate in differentiating this large variety of culprits!

The primary advantage of ANTECH® Cardio-BNP canine is that it allows easier discrimination among this long list of differentials, thereby identifying CHF as the perpetrator. Once the clinician has confirmed that CHF explains both the clinical as well as the radiographic changes, then appropriate treatment initiation/modification can occur. Sequential thoracic radiographs continue to offer an excellent modality to evaluate the response of CHF patients’ to treatment, especially when interpreted by a board-certified radiologist with Antech Imaging Services.

An advantage of using Antech Imaging Services is the ability to expect a clinically relevant report from a radiologist within a standard turnaround time of four hours, or within two hours if requested. This service is available 24/7/365. Other specialists are also available, e.g. cardiology and internal medicine. For more information, please contact support@Antechimagingservices.com or visit our website at www.antechimagingservices.com.

Please share your feedback with us regarding topics you’d like us to address in future newsletters! Just click on the following email link to submit your idea: newsletter@antechmail.com