

About the Cardiac Education Group (CEG)

The Cardiac Education Group is a registered not-for-profit organization of board-certified veterinary cardiologists from both academia and private practice that offers independent recommendations for the evaluation and treatment of canine heart disease. The group is committed to providing resources and information on the diagnosis, treatment and management of heart disease and heart failure in dogs and cats in order to promote detection and diagnosis with greater accuracy and confidence.

The CEG Mission

The CEG offers educational recommendations and resources that will help veterinarians diagnose, treat and manage heart disease and heart failure in dogs and cats, improving the lives of companion animals with heart disease.

The CEG promotes and facilitates:

- Educational activities to increase veterinarians' skills and confidence in diagnosing, treating and managing heart disease and heart failure.
- Tools and resources to help veterinarians detect and diagnose heart disease earlier and with greater accuracy.
- Recommendations to ensure dogs with heart failure receive optimal care and treatments to promote longevity and quality of life.
- On-line resources for veterinarians.
- Collaboration among pet owners and veterinarians pertaining to canine heart health.



The CEG is sponsored by a non-directed educational grant from Boehringer Ingelheim Vetmedica, Inc. and IDEXX Laboratories

Initial Treatment of Life Threatening Congestive Heart Failure (CHF)

Initial treatment of acute CHF should include injectable furosemide, oxygen and butorphanol sedation if needed. Administer pimobendan if the patient can tolerate oral medication. These patients require 24-hour care and may benefit from specialty referral. Stabilize the patient before transport is considered.

Complicating Airway Disease

The presence of some respiratory conditions may complicate classification of dogs with heart disease. This is especially problematic in distinguishing class B2 from class C dogs. Collapsing trachea, mainstem bronchial compression due to left atrial enlargement, chronic bronchitis or pulmonary hypertension may cause symptoms similar to those of congestive heart failure. These include coughing, tachypnea or symptoms related to airway obstruction. These patients may require additional diagnostic testing and/or therapeutic trials. See www.cardiaeducationgroup.org for additional details.

Whit M. Church, DVM, Diplomate ACVIM

Arizona Veterinary Specialists, Gilbert, AZ

John D. Bonagura, DVM, MS, Diplomate ACVIM

Professor, Veterinary Clinical Sciences, Ohio State University

Sonya G. Gordon, DVM, DVSc, Diplomate ACVIM

Associate Professor of Cardiology, Texas A&M University

Barret J. Bulmer, DVM, MS, Diplomate ACVIM

Tufts Veterinary Emergency Treatment & Specialties, Walpole, MA

Brian A. Scansen, DVM, MS, Diplomate ACVIM

Assistant Professor, Veterinary Clinical Sciences, Ohio State University

Rebecca L. Stepien, DVM, MS, Diplomate ACVIM

Clinical Professor-Cardiology, School of Veterinary Medicine, University of Wisconsin-Madison

Alan W. Spier, DVM, PhD, Diplomate ACVIM

Florida Veterinary Specialists, Tampa, FL



...bringing cardiology into practice



CANINE CARDIAC DIAGNOSTIC SCHEME

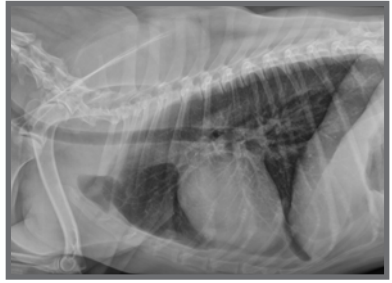

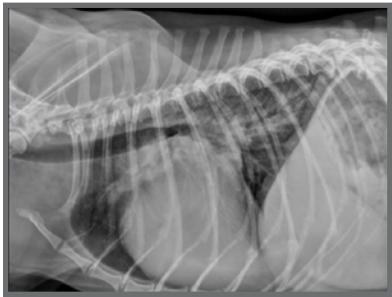
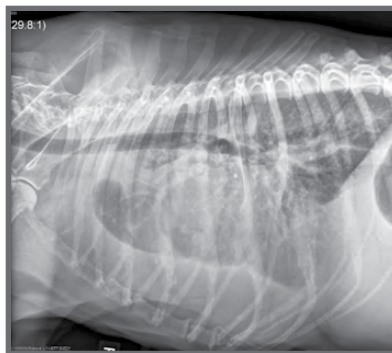
ABCDs of Canine Cardiology

Updated January 2014



...bringing cardiology into practice

Cardiac Education Group
www.cardiaeducationgroup.org
Current recommendations January 2014

HEART FAILURE STAGES	DIAGNOSTICS	CEG RECOMMENDATIONS
<p>A Dogs with no structural disease but high risk for developing heart disease</p>	<ul style="list-style-type: none"> • Patient history • Yearly auscultation • Screening programs for selected breeds 	<ul style="list-style-type: none"> • No treatment • Client education • Annual re-evaluation
<p>B Dogs with structural heart disease that have not yet developed clinical signs of heart failure</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="194 348 498 568">  <p>B1: No cardiac enlargement</p> </div> <div data-bbox="689 348 993 568">  <p>B2: Cardiac enlargement is present</p> </div> </div>	<ul style="list-style-type: none"> • Patient history¹ • Cardiac and pulmonary auscultation • Thoracic radiographs^{2,3} • Blood pressure • Electrocardiogram (ECG) when cardiac arrhythmia is evident during clinical examination • NT-proBNP⁴ increases over time are associated with progression of MMVD • Echocardiography for definitive diagnosis of underlying structural heart disease⁵ • 24 hour ambulatory (Holter) electrocardiogram (ECG) for evaluation of heart rhythm disturbances^{5,6} • Ambulatory event monitor electrocardiogram (ECG) for evaluation of syncope^{5,7} • Clinical lab tests: serum biochemistries, PCV/ TS (or CBC) and urinalysis (prior to initiating any therapy) 	<ul style="list-style-type: none"> • No specific dietary changes or exercise restrictions at this stage • Manage systemic hypertension if present <p>B1: MMVD* – No treatment DCM* – Since optimal therapy is uncertain, consulting a cardiologist may be useful in these patients</p> <p>B2: MMVD – ACEi* in dogs with severe cardiac enlargement DCM in Doberman pinschers – Pimobendan and ACEi in confirmed cases, consult a cardiologist regarding use of beta blockers or other therapies⁸ DCM in other breeds – ACEi in confirmed cases, consult a cardiologist regarding use of pimobendan, beta blockers or other therapies⁸</p>
<p>C Dogs with past or current clinical signs of heart failure</p> <div data-bbox="194 707 498 938">  </div>	<ul style="list-style-type: none"> • Patient history¹ • Cardiac and pulmonary auscultation • Thoracic radiographs^{2,3} • Blood pressure • Electrocardiogram (ECG) when cardiac arrhythmia is evident during clinical examination • NT-proBNP⁴ might help discriminate between dogs with respiratory causes of clinical signs or congestive heart failure • Echocardiography for definitive diagnosis of underlying structural heart disease⁵ • 24 hour ambulatory (Holter) electrocardiogram (ECG) for evaluation of heart rhythm disturbances^{5,6} • Ambulatory event monitor electrocardiogram (ECG) for evaluation of syncope^{5,7} • Clinical lab tests: serum biochemistries, PCV/ TS (or CBC) and urinalysis (prior to initiating any therapy) 	<ul style="list-style-type: none"> • Standard Treatment: Furosemide, Pimobendan, ACEi • Spironolactone is commonly added to long-term therapy • Atrial fibrillation⁸– digoxin⁹ and/or diltiazem • Ventricular arrhythmias⁸ – lidocaine for emergency therapy of ventricular tachycardia • Consider dietary changes – avoid excessive sodium intake and maintain adequate protein intake • Exercise as tolerated, avoid prolonged strenuous activity
<p>D Dogs with end-stage disease with clinical signs of heart failure refractory to standard therapy</p> <div data-bbox="194 987 498 1262">  </div>	<ul style="list-style-type: none"> • Patient history¹ • Cardiac and pulmonary auscultation • Thoracic radiographs^{2,3} • Blood pressure • Electrocardiogram (ECG) when cardiac arrhythmia is evident during clinical examination • NT-proBNP⁴ increases over time are associated with progression of MMVD • Echocardiography for definitive diagnosis of underlying structural heart disease⁵ • 24 hour ambulatory (Holter) electrocardiogram (ECG) for evaluation of heart rhythm disturbances^{5,6} • Ambulatory event monitor electrocardiogram (ECG) for evaluation of syncope^{5,7} • Clinical lab tests: serum biochemistries, PCV/ TS (or CBC) and urinalysis (prior to initiating any therapy) 	<ul style="list-style-type: none"> • Standard Treatment: Furosemide, Pimobendan, ACEi & Spironolactone • Digoxin if not contraindicated⁹ • Atrial fibrillation⁸ – digoxin⁹ and/or diltiazem • Ventricular arrhythmias⁸ – lidocaine for emergency therapy of ventricular tachycardia • Other therapies may be helpful but consultation with a cardiologist is strongly recommended • Dietary changes: avoid excessive sodium intake and maintain adequate protein and caloric intake • Exercise as tolerated, avoid prolonged strenuous activity
<p>KEY: Red text : ESSENTIAL diagnostic procedures Black text : Diagnostic procedures to consider</p>		

1. The history should include: exercise tolerance, resting respiratory rate, appetite, interaction with family, evident clinical signs (cough, collapse), and overall assessment of quality of life.
 2. A second opinion from a radiologist or cardiologist may be helpful.
 3. See www.cardiaceducationgroup.org for more information about radiographs and the Vertebral Heart Size (VHS).
 4. The role of this blood test is still evolving; obtained from a reference lab. Visit cardiaceducationgroup.org for more information.
 5. Often a referral examination.
 6. A Holter electrocardiogram is used to identify and assess severity of arrhythmias; a Holter electrocardiogram may be sensitive for recognition of cardiomyopathy.
 7. An event monitor electrocardiogram is useful for determining the cause of syncope.
 8. Additional medications or consultation with a cardiologist may be useful in select cases.
 9. Relative contraindications for digoxin include: impaired renal function (digoxin is eliminated by the kidneys); complicated ventricular ectopy (digoxin may worsen ventricular arrhythmias); conduction disease of the sinus node or atrioventricular node (digoxin may suppress these tissues).

*MMVD: Myxomatous Mitral Valve Disease
 *DCM: Dilated Cardiomyopathy
 *ACEi: ACE Inhibitor