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The CEO Corner

By Katie Newbold, CEO (LVT, CVPM)
We are so grateful for our amazing referral community! Recently I have received several messages of kudos for our service to your patients and it means so much when people take the time to reach out to us and give positive feedback, we truly appreciate it! We always want to hear if there is anything we can do to better serve you, your patients and your clients as well. Please reach out any time with feedback.

We wish all of you and your families a wonderful holiday season and look forward to working with you in the new year!

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**Nutritional Management of Heart Disease**

By Kacie Schmitt Felber, DVM, Diplomate, ACVIM (Cardiology)

With the overwhelming number and diversity of pet foods available to our clients and especially with the ongoing concern about BEG diets [boutique, exotic meat, grain-free/high legume content] and their relationship to nutritional cardiomyopathy, nutritional management of cardiac disease has become a hot topic. Below we will review general nutritional considerations for animals with heart disease as well as supplementation, when and how much.

**Sodium**

For years, severe sodium restriction at all stages of cardiac disease was the recommendation. However, it has been shown that sodium restriction in asymptomatic patients activates the renin-angiotensin-aldosterone system. It is unknown whether early RAAS activation causes long-term adverse effects, but it
may not be desirable and more moderate sodium restriction may be preferable in these cases. Additionally, concurrent medications must be considered as it has been shown that some dogs on a low-sodium diet plus furosemide +/- an ACE inhibitor can develop hyperkalemia. One study also showed that while electrolyte abnormalities are common in heart failure patients on medical therapy, a change in diet may exacerbate these abnormalities. Although low-sodium diets can decrease overall cardiac size based on echocardiographic measurements, more so in dogs with valvular heart disease than those with dilated cardiomyopathy, their long-term benefits are unknown (i.e. does the improved cardiac size affect survival and/or quality of life parameters?). In humans, although sodium restriction is advised in heart failure patients, data on sodium restriction and outcomes are inconsistent. Current recommendations are as follows:

<table>
<thead>
<tr>
<th>Heart Disease</th>
<th>Category</th>
<th>Allowable Na as a % of dry matter</th>
<th>mg of Na per 100 kCal of food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic (ISACHC Class 1a or 1b)</td>
<td>Mild Na restriction</td>
<td>0.3-0.4</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Mild-moderate CHF (ISACHC Class 2)</td>
<td>Moderate Na restriction</td>
<td>0.2-0.3</td>
<td>50-80</td>
</tr>
<tr>
<td>Severe CHF (ISACHC Class 3)</td>
<td>Severe Na restriction (generally not recommended)</td>
<td>&lt;0.2</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>

A resource we utilize for reduced sodium diet and treat recommendations is Tufts HeartSmart website for pet owners. Available at: [https://vetmed.tufts.edu/heartsmart/](https://vetmed.tufts.edu/heartsmart/)

**Protein**
Excluding patients with concurrent kidney disease at a stage that warrants protein restriction, there is no evidence that protein restriction is necessary for animals with heart disease or heart failure. Protein restriction may be deleterious and predispose these patients to cardiac cachexia and malnutrition. Unless dictated by a comorbidity, it is recommended that cats and dogs with heart disease/failure be fed a diet that meets AAFCO minimum nutritional requirements. If muscle loss is occurring, a higher protein diet may be needed. It is important to remember that patients with heart disease managed with ACE inhibitors +/- diuretics may become azotemic. In these patients, dose reduction or discontinuation of medication(s) is recommended over protein restriction, unless these changes fail to correct the problem or worsening kidney disease is noted.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>5.1 g/100 kcal</td>
</tr>
<tr>
<td>Cats</td>
<td>6.5 g/100 kcal</td>
</tr>
</tbody>
</table>

**Fats**
Dietary fats are a source of calories, carriers of fat soluble vitamins, and source of essential fatty acids. Most pet foods contain primarily omega-6 fatty acids (e.g. linoleic acid, arachidonic acid). Omega-3 fatty acids (e.g. eicosapentaenoic acid [EPA], docosahexaenoic acid [DHA]) are normally found in low concentrations in the cell membrane compared to omega-6 fatty acids. However, omega-3 fatty acids levels can be increased through diet and supplementation. The benefit of higher omega-3 fatty acids concentrations is that they have been shown to decrease inflammatory mediators, which leads to improved muscle mass, appetite, and myocyte energy metabolism. Additionally, omega-3 fatty acids have been shown to help suppress ventricular arrhythmias. While omega-3 fatty acid formulations should contain vitamin E as an antioxidant, they should not contain vitamins A or D as toxicity could be an issue. Cod liver oil should be avoided because it contains a lower concentration and different ratio of EPA and DHA. Flaxseed oil should also be avoided because, while the omega-3 fatty acid content is very high, it is in a form that is not well, if at all, converted to the desirable EPA and DHA in dogs and cats. Recently, we have also found some omega-3 fatty acid products contain xylitol and clients should be warned of this risk.

The benefits of fatty acid supplementation generally outweigh any risk, but there are potential risks and side effects. These include: diarrhea (typically dose-dependent), pancreatitis (theoretical concern if patient also on high fat diet), altered platelet function (likely not clinically relevant, but caution in patient with a thrombocytopathy), possible impaired wound healing (conflicting study data), and possible hyperglycemia and insulin sensitivity.

<table>
<thead>
<tr>
<th>Fatty Acid</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA (eicosapentaenoic acid)</td>
<td>40 mg/kg/d</td>
</tr>
<tr>
<td>DHA (docosahexaenoic acid)</td>
<td>25 mg/kg/d</td>
</tr>
</tbody>
</table>

Seemingly, there are as many supplement options as there are diet options for our clients. If there are questions or concerns about the quality of a supplement, we recommend referring to ConsumerLab.com as they perform independent testing on many human and pet supplements. There are some human supplements that contain xylitol and must be avoided. Additionally, formulations with high Vitamin A and/or D can approach toxic levels at the EPA/DHA doses outlined and are generally not recommended.

**Taurine**

Taurine is an essential amino acid in cats and non-essential amino acid in dogs. It is the most abundant free amino acid in the heart. While its exact mechanism of action is unknown, it is critical for normal myocardial function.
In the 1980s, taurine deficiency was identified as a primary cause of dilated cardiomyopathy (DCM) in cats as there was inadequate supplementation in diets. The addition of taurine to feline diets has dramatically reduced the number of cases of feline DCM. However, nutritional cardiomyopathy should still be considered in cats fed a poor quality diet, vegetarian, homemade, or otherwise imbalanced diet. With supplementation, clinical improvement is generally seen in about three weeks with echocardiographic improvement noted in about three to four months.

Taurine deficiency dilated cardiomyopathy is also well documented in dogs. Taurine deficiency has been identified in certain breeds affected with DCM (e.g. American cocker spaniel, Newfoundland, golden retriever) and has been associated with certain diets (e.g. so-called BEG diets, lamb meal and rice diets, high-fiber diets, highly protein-restricted diets). One of the reasons nutritional cardiomyopathy may affect large and giant breed dogs is because they tend to eat less of a maintenance diet than their calculated maintenance energy requirements. In this scenario, these dogs have an inadequate intake of precursor amino acids, in turn impacting taurine synthesis. In addition, some breeds may have a lower synthetic rate of taurine, a higher nutritional requirement for sulfur containing amino acids, and/or higher fecal taurine losses during enterohepatic circulation. The jury is still out on the exact role of BEG diets in nutritional cardiomyopathy cases. Of potential concern is the legume fiber source affecting gastrointestinal transit time and taurine recycling, legumes being limited in sulfur amino acids thus negatively impacting taurine synthesis, and the exotic animal protein sources having an unknown amino acid profile as well as unknown taurine and precursor bioavailability. It should be emphasized that not all nutritional cardiomyopathy cases are related to a documented taurine deficiency. And, the benefits of supplementation are less certain compared to cats. While some dogs will show partial or complete recovery with supplementation (and a diet change), the response tends to be less dramatic compared to cats and can take significantly longer. However, when a nutritional cardiomyopathy is suspected, our practice believes supplementation is warranted.

<table>
<thead>
<tr>
<th>Dogs</th>
<th>35 mg/kg PO BID-TID</th>
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<tbody>
<tr>
<td></td>
<td>500 mg for small-medium breeds</td>
</tr>
<tr>
<td></td>
<td>1000 mg for large breeds</td>
</tr>
<tr>
<td></td>
<td>1500 mg for giant breeds</td>
</tr>
</tbody>
</table>

| Cats                  | 250 mg PO BID |

**L-Carnitine**

L-carnitine is an essential amino acid required for normal fatty acid metabolism and energy production. In general, L-carnitine deficiency is an uncommon cause of DCM and the exact mechanism of development remains unknown. One study documented a family of Boxer dogs with DCM that had decreased levels of
myocardial carnitine. Affected dogs showed some reversal of disease with supplementation, but these dogs ultimately still died from their heart disease. Another study showed that 13 of 18 Doberman Pinschers with DCM had low myocardial carnitine levels. The deficient dogs who were supplemented lived longer than the dogs that did not have low carnitine levels. Lastly, a study of dogs with cystinuria and associated aminoaciduria that had revesive DCM had a carnitine deficiency. In these cases, cystinuria is associated with an increased urinary loss of carnitine and its precursor, methionine. The syndrome of congestive heart failure also appears to be associated with a secondary carnitine deficiency and L-carnitine supplementation could be beneficial by improving myocardial energy metabolism in animals with heart failure.

Identification of carnitine deficiency is difficult as plasma carnitine levels do not reflect myocardial levels and a myocardial biopsy is necessary to definitively diagnose this deficiency. Supplementation with L-carnitine is safe, but can be expensive in larger dogs. The L-form of carnitine must be used, as dogs do not convert regular carnitine to the L-form used by the heart.

| Dogs | 50 mg/kg PO TID |

Antioxidants and Coenzyme Q10

Although research has shown that dogs with congestive heart failure have an imbalance between oxidant production and antioxidant protection, the benefits of supplementation are theoretical; there are no studies to support or refute their use at this time. Despite this, supplemental antioxidants, such as Co-Q10, vitamin C, vitamin E, and β-carotene, are provided in many commercial veterinary diets.

Features of Prescription Cardiac and Select Non-Cardiac Prescription Diets for Affected Patients
Let it snow, let it snow, let it snow! In the event of extreme winter weather, CVCA Cardiac Care for Pets may institute delays or closings for the safety of our clients and employees. We will communicate any change to normal business hours on our location-specific Facebook pages so make sure to follow us! You may also call or email a location to check for any closings.
Upcoming Events

Shenandoah Virginia Veterinary Medical Association Dinner and Learn

- **Presented by:** CVCA Cardiac Care for Pets and Boehringer Ingelheim
- **Date:** Wednesday, January 15, 2020
- **Time:** 7:00-9:00 PM
- **Location:**
  - Front Royal Brewing Company
  - 122 E. Main Street
  - Front Royal, VA 22630
- **Speaker:** Brett Boorstin, DVM, Resident in Cardiology
- **Topic:** An Exciting Review of Common Arrhythmias: the Long and Short of It.

CVCA Cardiac Care for Pets and Boehringer Ingelheim sponsor a night of education in conjunction with the Shenandoah VVMA!

**RSVP to:**

- Lauren O. Reynolds, M.Agr
  - Field Sales Representative
  - Boehringer Ingelheim Animal Health
- [laurenO.reynolds@boehringer.com](mailto:laurenO.reynolds@boehringer.com)
- (540) 333-9319
2020 CVCA Calendar Contest Winners Announced!

Theme: "Funny Pet Photos: Your Pet's Funniest Moment!"

Our annual calendar contest is finished! CVCA clients, from all 14 CVCA locations, submitted their pets' funniest photos, via CVCA's Facebook page, and our social media fans and friends voted to pick the top 13 entries. The entry with the most votes earned the coveted calendar cover photo!

We received 86 entries, racking up a whopping 7,579 votes, earning Gunther, a CVCA patient from our Shoal Creek, Austin, TX location, the coveted cover photo!

To view all of the winners from this year's contest, visit our blog post!

Complimentary calendars can be picked up at any CVCA location. Hurry, supplies are limited.

Follow us on social media for the latest news, updates, and fun contests @cvcavets. Remember to check back October 2021 for our next calendar contest!

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Thank you for attending the 2019 Cardiology & Neurology Symposium!

A huge thank you to our sponsors, guests, and attendees for making the 2019 Cardiology & Neurology Symposium a success! Over 400 hundred attendees visited the Waterford in Springfield, VA on October 20 for four different lecture tracks. We're grateful to our 24 sponsors of the 2019 event for making it possible! For news on next year's event (will be announced in Spring 2020) make sure to check your email for updates and like our Facebook page!
To see more photos from this year's event, click here. Booklet photo courtesy of our guest sponsors Veterinary Surgical Centers.
Request No-Cost Client Education Materials

Our client education materials are available to your clinic at no cost. We have many available, including referral handouts like *When Your Pet Needs a Cardiologist*, and *When Your Pet Has a Heart Murmur* as well as educational handouts like *Nutritional Supplements for Cardiac Patients* and *Dilated Cardiomyopathy*. We have upwards of 20 different client handouts, including business cards, magnets, clinic posters, and more! Fill out a [Supply Request](#) form to order client materials today!

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Video - CVCA Cardiac Care for Pets Giving Back to Communities

CVCA Cardiac Care for Pets is committed to supporting our employees by allowing them opportunities to give back to their communities throughout the year either through dedicated paid volunteer hours or matching charitable contributions of their choice.

In 2019, over 700 hours will be volunteered by 91 employees in 14 locations. [Watch our video](#) to learn more!

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Available Client Payment Options

We know how tough it can be to face unexpected medical expenses for your pet. That's why we have several options to help you get an early diagnosis and appropriate treatment before advanced stages begin. Also, for qualified applicants, we also offer two low or no-cost options, CareCredit and Payment Banc. See our [Payment Options](#) for more information! If you have any questions, please email us at [info@cvcavets.com](mailto:info@cvcavets.com).
In the next issue...

February is American Heart Month!

References for "Nutritional Management of Heart Disease"


Freeman L. Beneficial Effects of Omega-3 Fatty Acids in Cardiovascular Disease. JSAP 2010;51:462-470.


Follow CVCA Cardiac Care for Pets on Social Media!

Find us @cvcavets on Facebook, Instagram, and Twitter!