Table 1. Mean (SD) of echocardiographic variables before and 7–10 days after placebo, standard-dose pimobendan (SD_pimo, 0.2–0.3 mg/kg PO q 12 h), and high-dose pimobendan (HD_pimo, 0.5–0.6 mg/kg PO q 12 h) in dogs with subclinical myxomatous mitral valve disease

Variables	Group	Before	After	p-value (Before vs After)	% change	p-value (% change among groups)
LAV (mL/kg)	Placebo	3.0 (1.0)	3.1 (1.2)	0.68	1.3 (15.6)	**0.004**
	SD_pimo	2.8 (0.8)	2.1 (0.6)	**0.002**	−22.7 (14.9)[a]	
	HD_pimo	3.3 (1.4)	2.4 (1.1)	**<0.001**	−27.1 (16.9)[a]	
LVVd (mL/kg)	Placebo	4.0 (1.1)	3.9 (0.8)	0.1	−0.2 (8.2)	**0.009**
	SD_pimo	3.8 (0.7)	3.2 (0.7)	**<0.001**	−16.7 (12.5)[a]	
	HD_pimo	3.7 (0.8)	2.9 (0.8)	**0.001**	−21.8 (15.0)[a]	
LVVs (mL/kg)	Placebo	0.86 (0.32)	0.77 (0.29)	0.47	−7.3 (35.6)	**<0.001**
	SD_pimo	0.99 (0.41)	0.57 (0.28)	**<0.001**	−41.6 (14.8)[a]	
	HD_pimo	1.06 (0.30)	0.48 (0.29)	**<0.001**	−55.0 (20.7)[a]	
LV EF (%)	Placebo	78.5 (4.3)	80.3 (6.7)	0.49	2.3 (7.3)	**0.007**
	SD_pimo	74.4 (7.2)	82.5 (5.4)	**<0.001**	11.3 (7.8)	
	HD_pimo	71.3 (8.3)	83.5 (8.9)	**<0.001**	17.6 (10.4)[a]	

LAV, left atrial volume; LVVd, left ventricular volume at end-diastole; LVVs, left ventricular volume at end-systole; LV EF, left ventricular ejection fraction; SD_pimo, standard-dose pimobendan; HD_pimo, high-dose pimobendan.
[a]Significantly different ($p<0.05$) compared to percent change of the placebo group.
Significant differences are in bold typeface.

ABSTRACT C04 Complications and outcomes associated with epicardial pacemakers in cats

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Epicardial pacemaker implantation is the treatment of choice for cats with clinical signs secondary to bradyarrhythmias. Complication rates and long-term outcomes, however, have only been reported in a small number of cats. The objectives of this study were to describe the major and minor complications in a larger population of cats (n = 20) that received epicardial pacemakers and to report their survival rates. Medical records (2003–2019) were reviewed. Presenting complaint, indication for pacing, presence of structural heart disease, presence of congestive heart failure, presence of a major or minor complication, and survival time were recorded and assessed in the statistical analysis. A complication was determined to be major if it was life-threatening or required replacement of the pacemaker system, while minor complications were not life-threatening and generally self-limiting or required minimal intervention. None of the variables evaluated were associated with a significant increase in the incidence of major or minor complications. The most common major complication was loss of ventricular capture (n = 6), which was successfully treated in all cases by increasing pacemaker output and/or replacing the pacemaker lead. Lead dislodgement, the most common major complication reported previously in dogs with epicardial pacemakers, was not documented in this population of cats. The overall survival time (MST 948 days) was similar to that previously reported in dogs with epicardial pacemakers (Figure 1). Fifty percent of cats had one or more major complication, which is comparable to major complication rates previously documented in cats. No statistical difference in survival

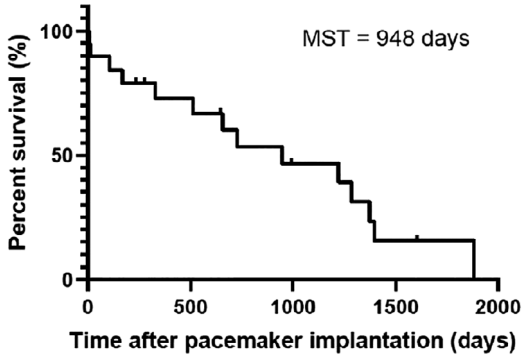

Figure 1. Kaplan-Meier survival curve for 19 cats. Tick marks represent censored data for cats still alive at study end or lost to follow-up. One cat died in the perioperative period and was excluded from the analysis.

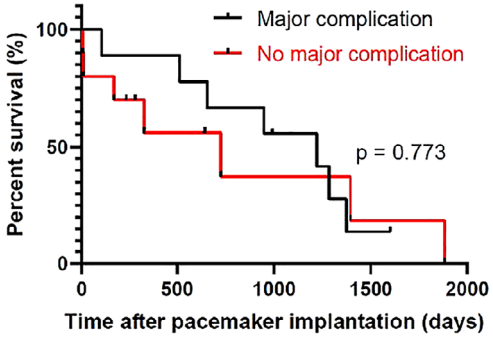

Figure 2. Kaplan-Meier survival curve comparing 19 cats with (n = 9) and without (n = 10) major complications. Tick marks represent censored data for animals still alive at study end or lost to follow-up. One cat died in the perioperative period and was excluded from the analysis.

time was identified between cats that experienced a major complication and those that did not (p = 0.773; Figure 2). This study provides relevant insights into the complications and outcomes of epicardial pacemakers in cats. Major complications were not associated with reduced survival time in this population.

ABSTRACT C05 The use of activity response settings in rate responsive pacemakers in dogs: A retrospective study

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Third degree atrioventricular block (3rdAVB) is a common bradyarrhythmia in dogs for which pacemaker implantation is the gold-standard treatment. Pacemakers with rate responsive mode (VVIR) capability are usually implanted, as these provide the option of heart rate adjustment in response to activity. The aim of the present study was to determine the efficacy of the rate responsive setting of VVIR pacemakers in dogs that have pacemakers for 3rdAVB. Medical records of the Ontario Veterinary College were retrospectively searched and a total of 28 dogs with VVIR pacemakers for 3rdAVB were identified. Pacemaker interrogations, 6–12 months after placement, detected that the dogs spent the most time at the programmed lower rate with only minor heart rate variation. In 9/28 (32%) dogs, the activity daily living (ADL) and exertion responses were increased one or two levels to improve pacemaker response to activity. In 5/9 (55%) dogs, this did not elicit heart rate variation; in one dog this resulted in heart rate variation (this dog had an epicardial lead with abdominal generator, contrary to the other dogs); 3/9 (33%) dogs died before re-evaluation. In the majority of dogs with VVIR pacemakers for 3rdAVB, the default rate responsive mode did not result in heart rate variation. An increase of the activity response settings did not improve pacemaker response to activity, and it is possible that further adjustments are required. Furthermore, positioning of the pacemaker generator might influence rate responsiveness of a VVIR pacemaker.

ABSTRACT C06 Use of omics technologies in the investigation of diet-associated dilated cardiomyopathy (DCM) in dogs

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The objective of this study was to use metabolomic and lipidomic data from diets and dogs to identify possible dietary factors associated with canine diet-associated DCM. Eighteen diets (9 non-traditional and 9 traditional) were analyzed in duplicate using metabolomic and lipidomic platforms (i.e., foodomics) at a commercial laboratory. Metabolomic analysis was also performed on 20 canine plasma samples: Dogs with DCM and congestive heart failure (CHF) eating traditional diets (n = 5), dogs with DCM and CHF eating non-traditional diets (n = 5), dogs with DCM but no CHF eating non-traditional diets (n = 5), and healthy control dogs eating traditional diets (n = 5). Samples were analyzed using Ultrahigh Performance Liquid Chromatography-Tandem Mass Spectroscopy. Of 830 biochemicals identified in the metabolomics profile of the dog foods, 261 were significantly increased and 153 were significantly decreased in non-traditional vs. traditional diets associated with multiple metabolic pathways. Of 966 biochemicals in the dietary lipidomic profile, 140 were significantly increased and 277 were significantly decreased in non-traditional vs. traditional diets. A number of metabolites distinguished the 2 diet groups including 3 unnamed biochemicals that were identified in 100% of non-traditional diets and 0% of traditional diets, but none of the 3 biochemicals was found in the plasma of affected dogs. Plasma metabolomic profiles identified multiple significant differences between dogs with CHF eating non-traditional vs. traditional diets. Omics technologies, such as metabolomics, can provide functional information on both individual diet constituents and blood biochemicals that may assist in drawing mechanistic connections between diet and complex, multifactorial diseases, such as diet-associated DCM.

ABSTRACT C07 Evaluation of myocardial fibrosis in cats with hypertrophic cardiomyopathy using cardiac magnetic resonance imaging

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Hypertrophic cardiomyopathy (HCM) is the most common heart disease in cats. Echocardiography is the non-invasive reference standard for diagnosing HCM; however, it has little to no value in assessing myocardial composition. Recent advances in cardiac magnetic resonance imaging (CMR) have allowed for detection of diffuse and focal fibrosis in a variety of heart conditions, including HCM. The objective of this study was to quantify myocardial fibrosis, namely T1 mapping and extracellular volume fraction (ECV) in healthy and HCM cats using CMR. Seventeen healthy and twelve HCM, age-matched, client-owned cats were prospectively enrolled. Tests performed included physical examination, indirect blood pressure, complete blood count, biochemical analysis including total thyroid, urinalysis, transthoracic echocardiogram, and CMR with contrast. Cats were considered healthy if all diagnostic tests were within normal limits and a diagnosis of HCM was determined by the presence of either focal or generalized left ventricular concentric hypertrophy >6 mm on echocardiography. Between groups, there were no statistical differences in regard to age, indirect blood pressure, or laboratory results. Statistically significant CMR parameters included left ventricular mass (healthy = 5.87 g, HCM = 10.3 g, $p < 0.0001$), T1 native mapping (healthy = 1122 ms, HCM = 1209 ms, $p = 0.004$), and ECV (healthy = 26.0%, HCM = 32.6%, $p < 0.0001$). Results of this study confirm that CMR is useful at detecting myocardial fibrosis in cats with HCM and that myocardial composition is different between normal and HCM cats.