

Prevalence of Atrial Fibrillation in the IWH 2000-2007 vs. 2007-2014

Tyrrell, Dentino, Abrams



Study Method/Description

- * Part of the Lifetime Cardiac Study and arm of Echo vs. ECG study
- * 6 Lead rhythm strip performed on all IWH
- * All ECGs read by boarded veterinary cardiologist or MD
- * Classified into two categories
 - * Atrial fibrillation
 - * Sinus rhythm
- * Populations compared



Results

1/1/2000 – 12/31/2006

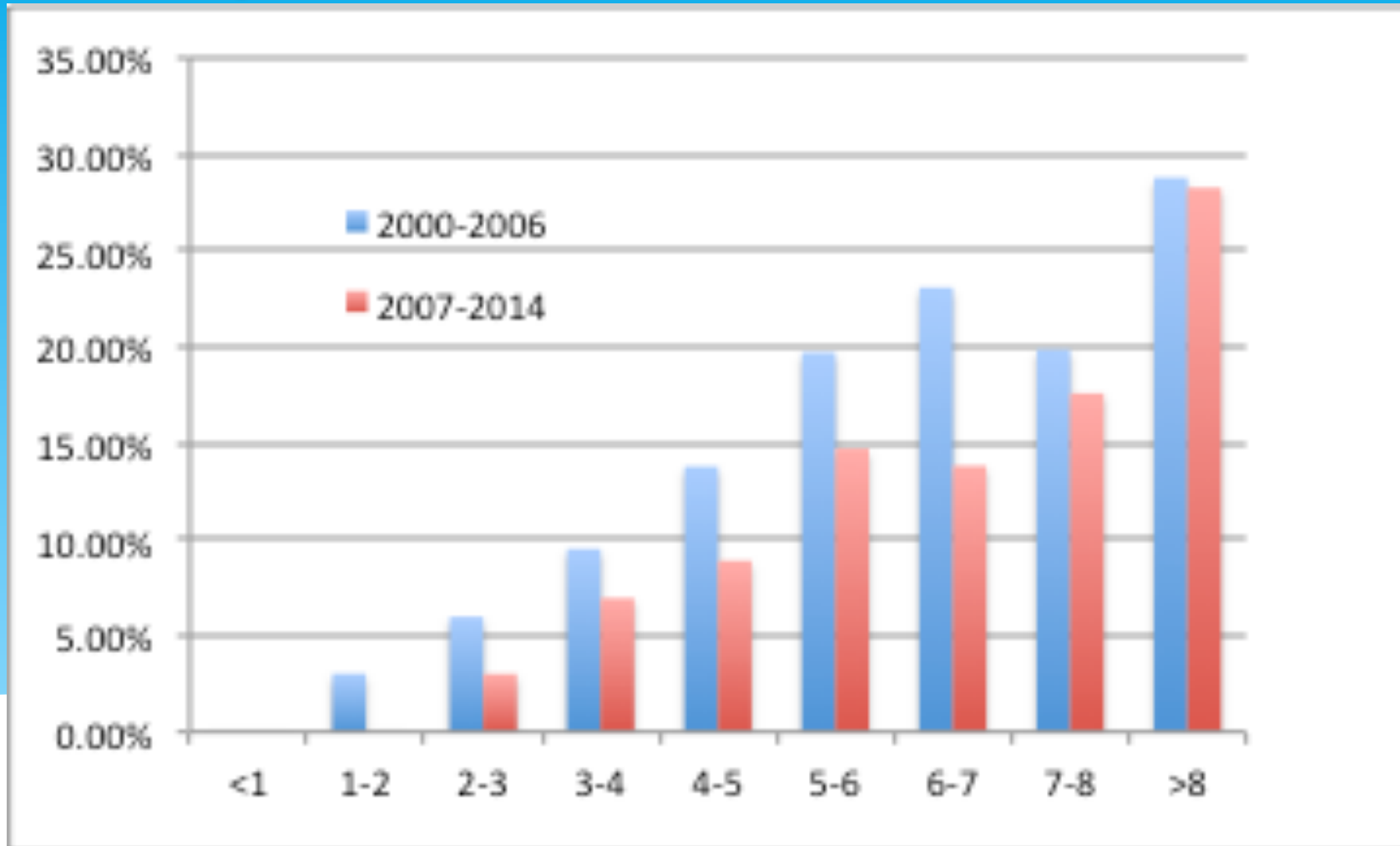
Age	A Fib		Normal Rhythm	
	n	%	n	%
< 1	0	0.00%	360	100.00%
1-2	15	3.03%	480	96.97%
2-3	31	5.98%	487	94.02%
3-4	41	9.51%	390	90.49%
4-5	52	13.79%	325	86.21%
5-6	54	19.71%	220	80.29%
6-7	54	23.08%	180	76.92%
7-8	46	29.87%	108	70.13%
>8	57	28.79%	141	71.21%
Total	350	11.51%	2691	88.49%

1/1/2007-12/31/2014

Age	A Fib		Normal Rhythm	
	n	%	n	%
< 1	0	0.00%	7	100.00%
1-2	0	0.00%	57	100.00%
2-3	7	3.02%	225	96.98%
3-4	13	6.95%	174	93.05%
4-5	13	8.90%	133	91.10%
5-6	20	14.71%	116	85.29%
6-7	17	13.82%	106	86.18%
7-8	19	17.59%	89	82.41%
>8	52	28.26%	132	71.74%
Total	141	11.95%	1039	88.05%



Atrial Fibrillation Percentage By Age Comparison 2000-2006 & 2007-2014



Conclusions

- * Tendency in the data toward a difference in the prevalence of atrial fibrillation between the two generations, however, prevalence increases with age
- * Pre-breeding examinations (echo/ECG) did reduce the percentage of IWH affected with AF in younger dogs



Conclusions (continued)

- * 2403 females and 1833 males total over the two generations (total population of 4236 IWH)
- * Two-Sample test of proportions yielded $z=-2.43$ with a $p\text{-value}=.0075$
- * $M \gg F$



Limitations

- * 2007-2014—encouraged older IWH to enroll
- * Predominantly breeding IWH but still many pet/rescue IWH were enrolled
- * Some IWH did receive multiple ECGs while some only received single ECG





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Echocardiographic and Electrocardiographic Screenings of Outwardly Healthy IWH

Tyrrell, Abbott, Green, Rosenthal, Dentino, Abrams



Purpose

Evaluate associations
between ECG and echo
findings in the IWH



Methodology

- * 576 different IWH screened via echo and ECG by BT, HG, SR between 2006-2014
- * Screening examinations primarily performed at national specialty shows
- * 6 lead ECG rhythm strip evaluated by boarded cardiologist
- * Echo performed in standing position by boarded cardiologist
 - * Standard views obtained



Study

- * Methods –

- * Retrospective evaluation of data acquired from screening examinations intended to identify heritable cardiac disease
 - * Standard echocardiographic/electrocardiographic examination
- * Subjects were classified based on quantitative echocardiographic variables according to breed specific reference intervals defined by ranges of body-weight (Vollmar, 1999)
 - * LV dilation
 - * LA dilation
 - * Myocardial Dysfunction defined by end-systolic left ventricular dimension
 - * “Occult DCM” defined by presence of LV dilation and Myocardial Dysfunction



Stats (for those who care...)

* Analysis

- * Comparison of proportions by Fisher's Exact Test
- * Comparison of continuous data through Student's T-test/Mann-Whitney
- * Logistic regression with future development of disease as outcome variable
- * $p < 0.05$ considered significant



Results

- * **Study Population:**

- * 346 female (60.1%) and 230 male (39.9%) adult wolfhounds examined at least once

- * 135 of these were examined at least one additional time, typically at one year intervals

- * Mean (\pm SD) Body Weight: 64.58 (\pm 8.93)

- * Median (Range) Age : 3.14 years (1-11.43 years)



Results – Atrial Fibrillation

- * 2D LA: Ao greater in hounds with AF
 - * $1.49 (\pm 0.35)$ v $1.12 (\pm 0.13)$ $P < 0.0022$
- * 45.1% classified as LV dilation
- * 35.3% classified as myocardial dysfunction
- * 29.4% classified as occult DCM

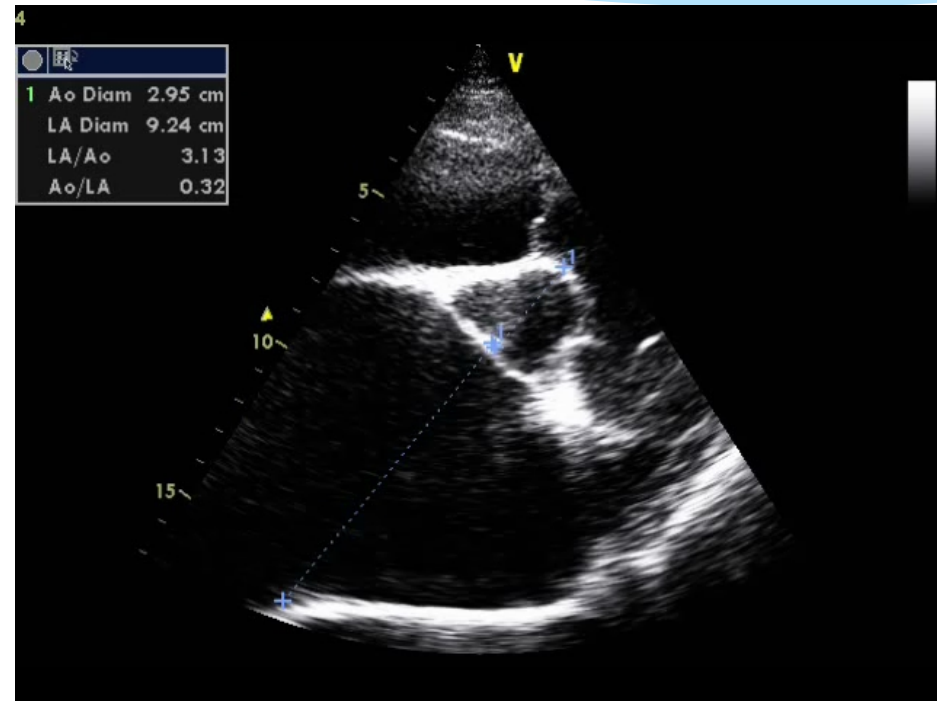
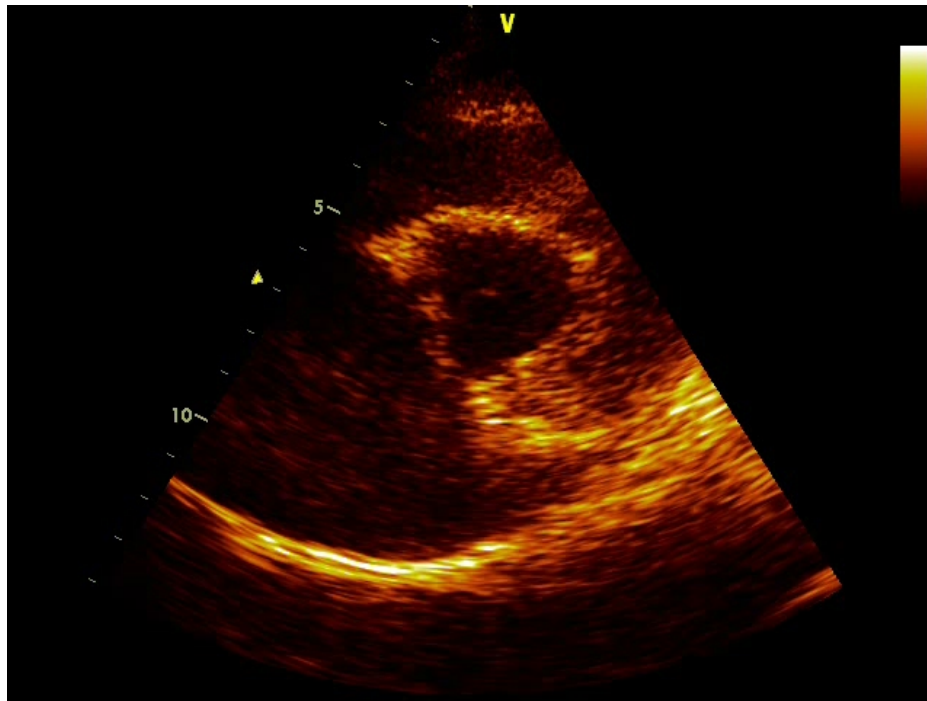


IWH Type DCM/Cardiomyopathy

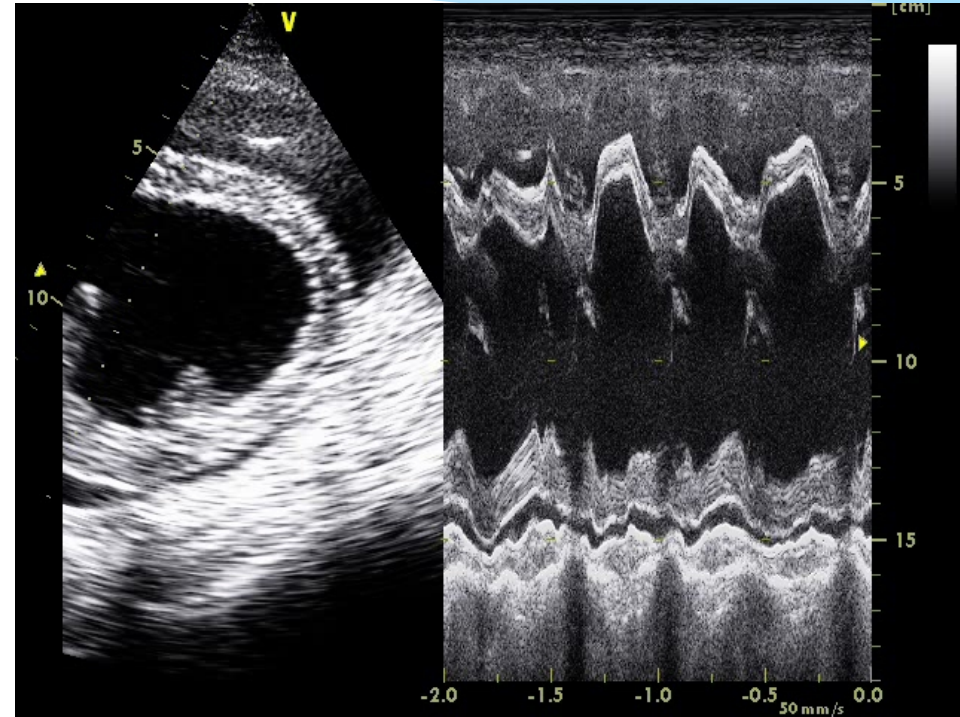
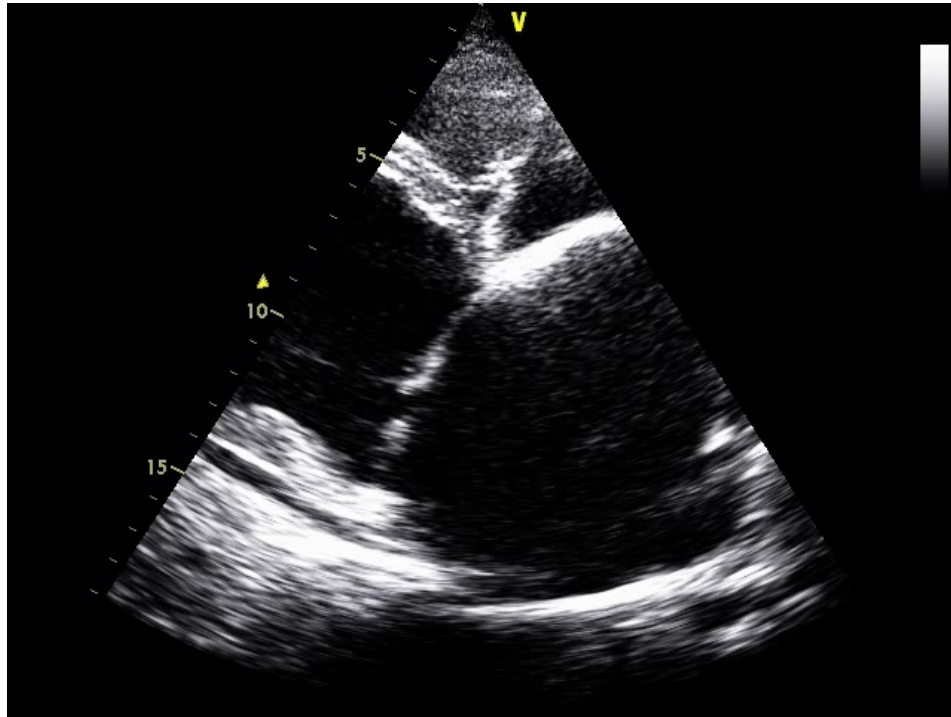
- * Atrial fibrillation
- * Progressive left atrial dilation
- * Variable mitral valve regurgitation
- * Left ventricular dilation with fairly preserved systolic performance
 - * Very similar to that of small breed DMVD
- * All have LA:Ao ≥ 1.5



IWH Type DCM



IWH Type DCM/Cardiomyopathy



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Other Interesting Facts

- * 161/725 (22.21%) had trace to mild leaks in the mitral and/or aortic valves
- * 21/725 (2.99%) had ventricular premature beats (VPCs/PVCs) but only one IWH was found to have overt Doberman type DCM
- * Two heart base tumors—one incidental and one in tamponade



AF as Predictor of Left Atrial Enlargement

2D LA:Ao > 1.5

*Sensitivity = 89.47% (CI 66.86 – 98.7%)

*Specificity = 95.33% (CI 93.01 – 97.05%)



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Limitations

- *Small sample size in particular of diseased or arrhythmic patients
- *Large amount of breeder owned IWH
- *Small amount of IWH with serial examinations



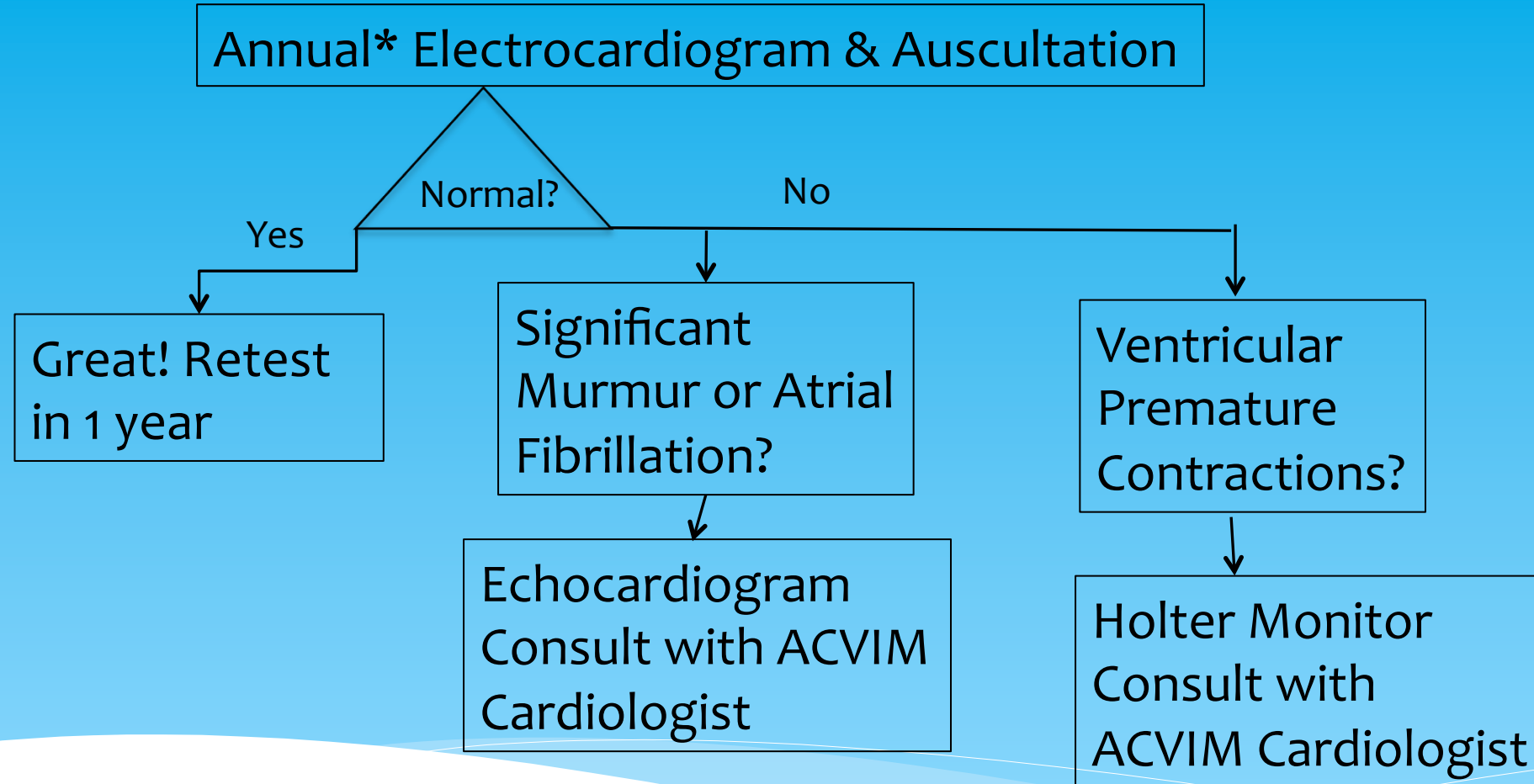
Conclusions

- * ECG is an acceptable screening diagnostic tool for IWH type DCM, e.g. enlarged LA with
- * Trace to mild MR and AI is very common in the IWH
- * IWH Type DCM and AF have an intrinsic relationship
- * IWH Type DCM is characterized by progressive LAE, mild to moderate LVE with fairly well preserved subjective LV performance
- * Only rare presentation of typical DCM



Recommendations Based on our Research and Experience

Heart Testing Recommendations All Irish Wolfhounds



*After the age of 5, EKGs should be biannual

Breeding Stock

- * All breeding stock should at least have an EKG and auscultation by boarded cardiologist*
- * Breeding stock should get EKG with brucellosis test
- * Breeding Recommendations
 - * Any IW with with onset of AF under 5 yrs should not be bred
 - * Dogs with a strong family history should be bred with caution
 - * Any bitch in atrial fibrillation should not be bred
 - * Any IW VPCs or APCs should be discussed with a cardiologist
 - * Any IW with a murmur should have an echo

*Registry in an open register such as OFA is suggested



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Thank you



- * Irish Wolfhound Foundation (Drs. Mariellen Dentino and Frances Abrams)
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