



HEART STUDY UPDATE

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Summary

As a follow-up to initial cardiovascular screening conducted on six Toy Manchester Terriers in 2009, the study team recently completed a second round of testing that included screening of two new Toy Manchesters and a re-check of four of the six Toy Manchesters originally tested.

Background

In 2009, Dr. Etienne Coté began his investigation of the physical properties of juvenile cardiomyopathy in Toy Manchesters via cardiac screening. He initially screened 6 dogs with the goal of learning more about the condition and determining whether there is any way to detect carriers or affected dogs. The initial results revealed possible abnormalities in the form of an intermittent arrhythmia called second degree atrioventricular (AV) block. This is a normal finding in all dogs that are physically fit, but usually occurs when the heart rate is slower than was the case for these dogs. Additionally, a small area of scar tissue was identified on the hearts of several dogs. A complete summary of 2009 results can be located under “Published Articles” at <http://www.canadamt.com/health/heart/> While the results of the initial screening were extremely interesting, their significance could not be determined without further testing.

Implementation

With financial support from individual breeders and the American and Canadian Manchester Terrier Clubs, further testing was conducted by Dr. Etienne Côté and Elaine Reveler AHT, on October 31, 2011 at the University of Prince Edward Island. The following tests were performed on each of the six participating dogs:

- Echocardiogram/cardiac ultrasound (includes complete 2D, M-mode, spectral and colour Doppler and calculation of left ventricular volume and mass)
- 10-lead electrocardiogram
- Chest X-Ray
- Serum cardiac troponin-I levels
- Exercise testing consisting of repeated portable ECG monitoring periods during stair climbing


Additionally, tests for the two dogs that had not been previously seen included a complete blood count, serum biochemistry profile, and urinalysis.

In order to ensure a diverse pool of tested dogs, new individuals to be tested were selected based on predefined criteria including age, sex, degree of relation to original dogs tested, etc. We were fortunate to have the opportunity to both re-check a number of original participants and to test two dogs whose pedigrees incorporate contributions from different kennels and geographic areas without incurring additional shipping or travel costs. In total, the eight dogs tested represent individuals from five breeders in three countries.

While the majority of tests performed are standard for cardiac screening, the exercise test continues to represent an experimental approach to measuring heart rate and rhythm normally obtained through more time-consuming Holter monitoring. In order to measure the heart's function under a variety of circumstances, each dog wore a portable EKG monitor and ran up and down six flights of stairs. Cardiac rate and rhythm (EKG) were measured before exercise, during exercise and for several minutes afterwards, giving a complete look at the heart's rhythm and heart rate dynamics at rest, under stress, and during its return to normality.

Results

The extensive cardiovascular diagnostic testing that each of these dogs underwent revealed several minor abnormalities that are considered less likely to be related to juvenile dilated cardiomyopathy. This result is both rewarding and difficult: rewarding because it does not reveal evidence of a severe, pervasive problem and because it better defines breed-specific cardiovascular characteristics in the Toy Manchester Terrier; and difficult because it does not offer a convincing marker for juvenile dilated cardiomyopathy so far in these 8 dogs. While a convincing abnormality and "smoking gun" would be desirable, it is extraordinarily rare for an initial examination of subjects to reveal all answers in such a limited pool of screened dogs. Rather, this important first step represents a step away from the alternative, which is inevitably worse: denial, resulting in problems that expand unchecked.



The American Manchester Terrier Club's Health Committee can provide assistance in paying for necropsies through their innovative **Breeder's Challenge Fund**. We recognize that necropsies can be expensive, however the information and genetic material necropsies provide is priceless.

For more information or to access the Breeder's Challenge Fund, please contact Michelle Barlak, Heart Study Liaison (michelle@bleusprings.net). Users wishing to remain anonymous may direct inquiries to Dr. Shannon Martinson, Diagnostic Pathologist (smartinson@upei.ca)

While individual test results are protected, data from both rounds of testing together shed new light on cardiovascular function in Toy Manchester Terriers that we can share. It appears, for example, that more than dogs of other breeds, Toy Manchester Terriers are prone to Mobitz type II second-degree atrioventricular block, a type of skipped heartbeat seen in three of the eight dogs tested. This finding can suggest a heart problem, especially when considered in the context of an investigation into heart disease that is acutely lethal. Preliminary results in these 8 dogs suggest that individuals in the breed may be more likely to develop this finding on an electrocardiogram than most dogs. Practical considerations include: that an ECG during anesthesia (such as for neutering) should be considered essential, ideally with a printer so that any unusual or abnormal heart rhythms may be captured on paper for later review; and that careful selection of anesthetic agents should be undertaken to reduce the likelihood of furthering atrioventricular block.

These and other findings lay an important foundation for continued exploration of the cause of this disease in the breed. Because there are so many interindividual variations that are of no consequence, the only way to understand and eliminate them from contention as possible markers of heart disease is via the screening process. The way to do so necessarily involves continuing to screen more dogs.

