Summer 2013

From the Editor's pen,

The end of 2013 is nearly upon us and many of us are busy with Christmas and holiday preparations. Please remember our four-legged friends and make certain they are well looked after when you are away!

Summertime also means it is time again for the Summer Newsletter. Again we have some interesting articles. Boxers are prone to developing spondylosis and we have compiled an article to explain what this is and what the signs of it are. We also have more info on Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC) in boxers; a genetic disease for which there now is a genetic test available.

We hope you will enjoy this newsletter. The Breeders Panel also would like to wish those that will be traveling in the coming weeks a very safe journey!

Regards

Els Sporen

(Secretary: FBCSA Breeders Panel)

NewsFlash!

"The process of puppy registrations will become an online process!"

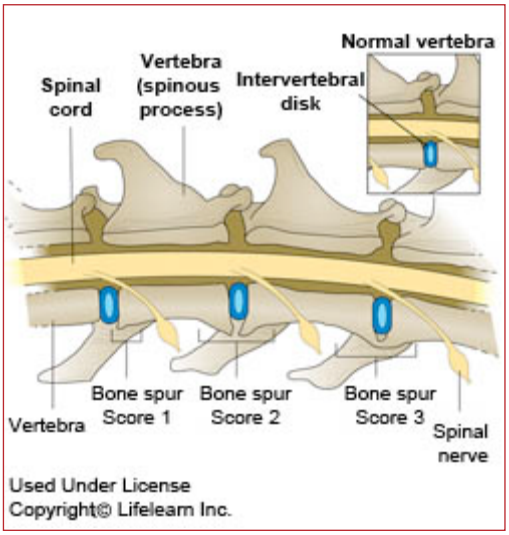
Feedback from Mr. Herman Labuschagne, SA Stud Book: The Federation of Boxer Clubs of Southern Africa and SA Stud Book met on 28 September 2013 and discussed the recording of the Boxer breed on the Logix database. Systems are in place to enable the FBCSA to go live on the Logix system in order to start recording information directly with SA Stud Book. It was decided that the office will work parallel on both systems until the FBCSA is happy to let the breeders start using the online Logix recording system. Breeders are welcome to register a username and password on Logix to see the information of their own breeding. Breeders can go to www.logix.org.za and register. Once the electronic recording has been finalised, the breeders can start to record their litters and animals online. All data is thoroughly screened by SA Stud Book for errors to ensure integrity in the information. We hope to complete the test phase by the end of 2013 where after we can go live.

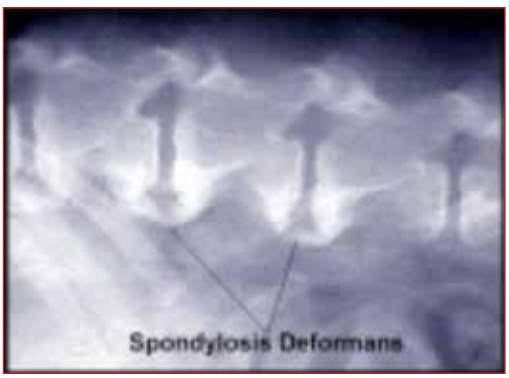
Spondylosis

"The boxer is one of the dog breeds prone to developing spondylosis; a degenerative disease of the spine"

What is spondylosis?

It is a degenerative disease of the spine. In the normal spine, the vertebrae are joined by ligaments to form a flexible protective column around the spinal cord. There are discs between the vertebrae which act as shock absorbers and cushions. If the discs become damaged the joints between them become less stable, resulting in abnormal motion. To re-establish stability of the damaged joint(s), bone spurs will develop next to the discs between the vertebrae. These growths may vary from small spurs to large bridges spanning across the entire disc space. This is clearly visible on X-rays.





Symptoms
Most dogs with mild spondylosis have no symptoms. Symptoms of more severe spondylosis may include:

- dog with back pain
- lameness
- muscle atrophy
- neurological problems (rare)

Because nerves can become trapped this way this condition can cause severe pain. Other signs may be that your dog becomes incontinent, keeps him/herself away from other dogs or even may become more aggressive. Your dog may move differently or may have problems getting up. Others again may have problems defecating. Although more common in older boxers, even young animals may suffer from this condition.

How does one recognize back problems?
If your dog stretches or shakes him/herself he/she will normally do this with the whole body, from top to tail. A dog with spondylosis will no longer do this but will only shake his/her head and neck. Also stretching with the front legs but not the back legs is a sign of back problems. This is worse in winter and thus it is a good idea to keep the back warm.

Is spondylosis genetic?
Controversy persists over whether spondylosis is passed from dog to dog genetically. Proponents of this theory posit that the vertebrae in dogs genetically predisposed to develop spondylosis are born with weaker vertebrae, unable to withstand even the smallest traumas without injury. Others say the condition is a "middle-age disease." Finding the exact cause is difficult because the condition varies so widely across breeds.

Diagnosing spondylosis
Your vet will probably x-ray your dog if spondylosis is suspected. However, in order not to rule out other conditions-like osteochondrosis, osteoarthritis and spondylitis (inflammation of the vertebrae caused by trauma or infection)-your vet will likely perform other tests. These will probably include the following:

- myologram, which detects compression of the spine
- force plate analysis, which measures weight tolerance in evaluating lameness
- joint fluid analysis, which helps distinguish between degenerative diseases (like Spondylosis) and infectious ones

Treating spondylosis in dogs
The treatment for spondylosis includes administering non-steroidal anti-inflammatory drugs and sometimes performing surgery. Along with these remedies, exercise the utmost patience when your dog, afflicted with this condition, can't seem to do what other dogs usually do.

Read more: *An Overview of Spondylosis in Dogs http://www.vetinfo.com/overview-spondylosis-dogs.html*

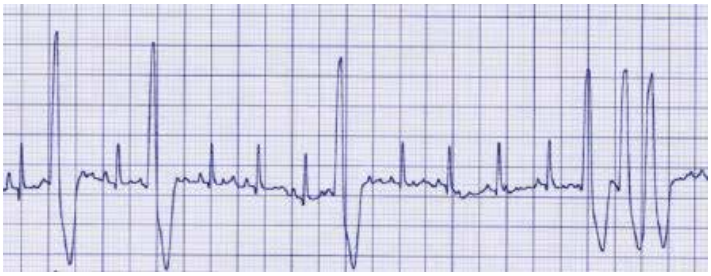
Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)

(Written by: Henriette van der Zwan, Inqaba Biotec)

"Boxer arrhythmogenic right ventricular cardiomyopathy (also known as Boxer cardiomyopathy) is a disease of the myocardium primarily affecting Boxer dogs"

What is ARVC?

ARVC is a disorder that affects the heart muscle and resembles a condition found in humans with the same name. The tissue of the heart muscle is replaced with fatty or fibro-fatty tissue. ARVC can lead to sudden cardiac arrest when the dog gets excited or is exercised. It is usually adult onset and there are three different forms of the disorder. Please discuss the symptoms in more detail with your veterinarian. ARVC can be clinically diagnosed with an ECG or a halter monitor. However these methods cannot pick up a heterozygote or in cases where the symptoms have not yet manifested.



Three lead ECG consistent with right sided origin ventricular premature beats which is commonly noted in dogs with ARVC. This rhythm can be particularly dangerous and may progress to a life threatening arrhythmia.

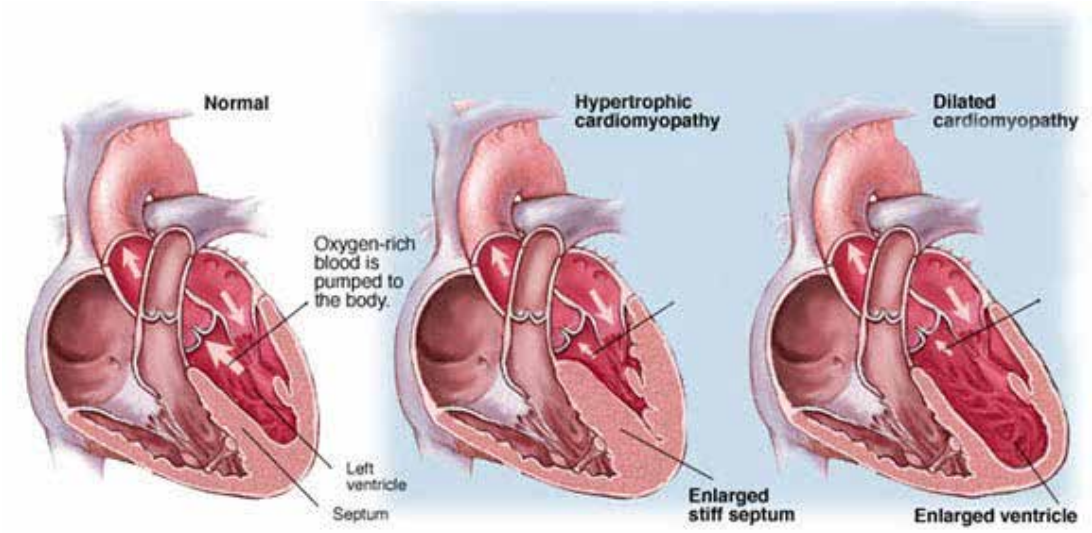
Boxer dog showing appropriate Holter monitor placement

Cardiomyopathy

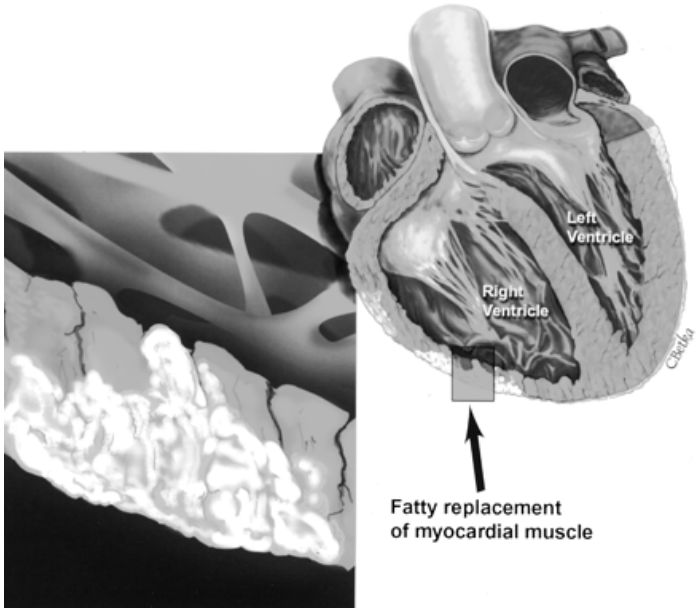
Cardiomyopathy, or heart muscle disease, describes a group of heterogeneous conditions that affects the heart muscle functionally and/or structurally or morphologically. There are four main types of cardiomyopathy: — dilated, hypertrophic and restrictive, Arrhythmogenic right ventricular dysplasia.

1. Hypertrophic cardiomyopathy: is a condition in which the heart muscle becomes thick. This thickening makes it harder for blood to leave the heart.

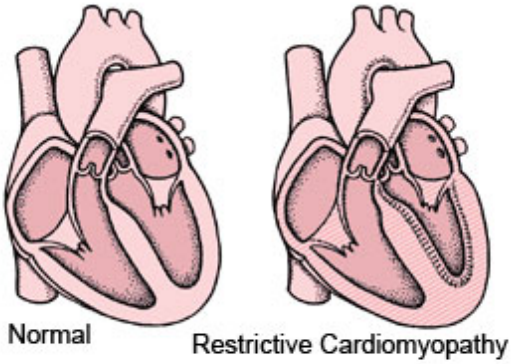
2. Dilated cardiomyopathy: is a condition in which the heart becomes weak and large. It cannot pump blood well enough.



3. Arrhythmogenic right ventricular dysplasia: the muscle of the right ventricle is replaced by fat and fibrosis, which causes abnormal heart rhythms.



4. Restrictive cardiomyopathy: is a group of disorders in which the heart chambers are unable to properly fill with blood because the heart muscle is stiff.



In restrictive cardiomyopathy, the walls of the ventricles become stiff, but not necessarily thickened.

(http://thecafetechno.com/tutorials/life-science/he-deterioration-of-the-function-of-the-myocardium/)

Which breeds are affected by ARVC?
Boxers

How is the disease inherited?
Each animal has two copies of each gene, one inherited from its mother and one from its father. ARVC is inherited as an autosomal dominant with incomplete penetetrance trait that affects males and females equally.

An autosomal dominant disorder implies that only one copy of the mutant gene needs to be present in order for the animal to display disease symptoms. Incomplete pentetrance implies that not all heterozygotes (having only a single mutant copy) will develop the symptoms of this disorder. Many heterozygotes do display the symptoms and owners should advise their veterinarian about the dog's genetic status.

The causative mutation occurs in the 3' untranslated region of the canine Striatin gene and entails the deletion of eight base pairs (Meurs et al., 2010). This deletion of nucleic acids alters the amino acid composition of the protein and causes the disease.

Testing for ARVC
There is no cure for ARVC but the test offered by Inqaba biotec indicates if the dog is clear (homozygous for no deletion), a heterozygote or affected by the causative mutation (homozygous for the deletion).

Clear: Both copies of the gene are normal (homozygous for no deletion) therefore the dog will not display the disease symptoms, nor will it pass the mutant copy to its offspring.

Heterozygote: One copy of the gene is normal and one copy is a mutant copy. These animals may display the symptoms of the disorder, and may pass the mutant copy to its offspring.

Affected: Both copies of the gene are mutant (on both copies the deletion is present) and these dogs are very likely to display the symptoms. Affected dogs will pass the mutant copy to its offspring.

What are the breeding implications for my dog?
Table 1 gives a representation of the mating outcome of dogs with different ARVC statuses. The percentage given is the probability for each pup to be clear, a carrier or affected by the causative mutation

Table 1: Possible mating outcomes

Parent 1 genotype	Parent 2 genotype		
	Clear	Heterozygote	Two mutant copies
Clear (No mutant copies)	All Clear	50% Clear 50% Heterozygote	All Heterozygote
Heterozygote (One mutant copy)	50% Clear 50% Heterozygote	25% Two copies 25% Clear 50% Heterozygote	50% Heterozygote 50% Two copies
Two copies (Two mutant copies)	All Heterozygote	50% Heterozygote 50% Two copies	All Two copies

Samples and other documentation needed:
- 1 – 2 ml whole blood in an EDTA tube collected by the breeder's local veterinarian OR
- FTA card sent to you by Inqaba biotec
- Copy of FBCSA registration documents
- Request form (please download and complete for each dog tested) (http://www.inqababiotec.co.za/)

Results:
Results indicate if the dog is clear, a heterozygote or affected by the causative mutation. Results will be generated within 10 workdays after the sample was received. The results consist of a report as well as a certificate sent to the owner.

References:
Genome-wide association identifies a deletion in the 3' untranslated region of Striatin in a canine model of arrhythomegenic right ventricular cardiomyopathy. 2010. Meurs K. M., Mauceli E., Lahmers S., Acland G.M., White S.N., Lindblad-Toh K. Human Genetics 128:315-324

We wish you a blessed Christmas and a very happy New Year!

Breeders Panel December 2013