

Tricuspid Valve Dysplasia in Labrador Retrievers

Tricuspid Valve Dysplasia, or TVD, is a heart disease that can affect Labrador Retrievers, in addition to several other breeds. At the moment it is thought to be genetic, but expression (e.g. a dog who has TVD) is a condition controlled by multiple genes. It does not appear to be a simple autosomal recessive disease like the other common problems we test for, such as Exercise Induced Collapse (EIC), Progressive Retinal Atrophy (PRA), and others. Both Embark and North Carolina State University have separately done research to try to identify the genes involved, but at this time neither has been successful.

The tricuspid valve is a valve on the right side of the heart, between the top (atrium) and the bottom (ventricle). This valve is supposed to close tightly so that when the heart contracts, all the blood in the bottom chamber (ventricle) gets pushed out, and sent to the lungs to pick up more oxygen (through the pulmonary artery). When the tricuspid valve is dysplastic, it has some degree of thickening or tethering, so that it doesn't close tightly. When the heart contracts, some of the blood in the ventricle is pushed back (regurgitation) into the previous chamber (atrium).

Heart conditions such as TVD are diagnosed by ultrasound of the heart, not by radiographs. Dogs with TVD sometimes have a heart murmur, but in many cases do not. Depending on the degree of abnormality to the tricuspid valve, dogs may be graded as mild, moderate, or severe. Or, they might fit in the weird gray category called "equivocal", where the cardiologist doesn't think there's enough abnormality to call the dog Mild, but it isn't an obvious Normal either. Instead, they say it is Equivocal and ask to recheck it in 6 months or 12 months, where they hope to make a more definitive decision about the grade.

The current thought by the majority of reputable breeders, is that all breeding stock should have an OFA cardiac echo clearance by a cardiologist to screen for TVD. The difficulty is that some areas of the country do not have cardiologists, or they are booked out for months, or the cardiac echo clearance is \$800-1000/dog. Or, sometimes breeders want to use frozen semen on stud dogs who were frozen long before echocardiograms were common.

It's still worth noting that the majority of reputable breeders make the effort to get an OFA echo done on their breeding stock, even if it requires driving or a little extra work to find a cardiology clinic at a dog show. Discriminating puppy buyers should still look for breeders who have done echos on their breeding stock.

Now, just because both parents and even all four grandparents and the eight great-grandparents have echo clearances, does not mean all puppies will have normal hearts.

The genetics behind TVD appear to be more complicated than simply breeding normal to normal.

I am not a cardiologist, but I do use one to screen all my puppies between 7 and 8 weeks of age. At the time of this writing, I have had 110 puppies screened by echo from 11 sires and 6 dams. The incidence of hearts that fall into categories of equivocal, mild, and moderate TVD is currently 22%. It does not matter whether puppies are from straight show pedigrees or straight field trial pedigrees. It does not matter whether they are tight line breedings or huge outcrosses. I have used full sibling stud dogs and had one litter completely normal and the other litter with 2/7 puppies marked as equivocal. I have had bitches throw one litter completely normal and the next with 4 equivocal and one moderate TVD out of 8 puppies. I have seen two stud dogs I won't use again due to the higher than average incidence of TVD in the litter. It's clear that it shows up more in some pedigrees than others – but it isn't consistent enough to be able to predict whether a litter is going to be normal or not.

That said, I cannot imagine that anyone else has better numbers than I do with my dogs. I do think no one else knows what their numbers are, because no one else tests their puppies by echo. I've gotten lucky in that I live somewhere with multiple cardiology options, and a 3 hour drive (which isn't bad) from a cardiologist who enjoys working with me, and has been extremely accurate on the grading of my puppies (when retested as adults by other cardiologists). I suspect other breeders have similar percentages, but when there's only a handful of puppies kept in homes that plan to breed and only a few of those do cardiac echos – most people never know they have an affected puppy.

Long term prognosis for equivocal and mild TVD puppies is excellent. As mentioned, most people never know they have an affected puppy, because there's no heart murmur and no physical limitations. Many times TVD is only discovered when a breeder takes a dog in for health clearances prior to breeding. It is at that point that the owner learns the search and rescue dog, or the field trial dog, or the hunting dog, also has TVD and should not be bred. At this point, per my cardiologist's recommendations, and noting TVD dogs participating in upper level performance events, I have no concerns placing an equivocal or mild TVD puppy in a pet or performance home. I will not place them in a home that intends to breed, and they will always go on AKC Limited Registration.

I try to have the discussion about echo results when people contact me asking about puppies, because statistically, I'm going to find 1-2 puppies per litter that are equivocal or mild. It's nice to at least have talked about it once so it isn't a surprise. I realize I'm not helping myself by looking for problems (hearts, eyes, hernias, both testicles descended, normal bites, etc) because then I have to discuss findings and who is comfortable owning

what, after pups get all their health testing and physical exams done around 7-8 weeks. But IMO it is much easier to find everything that isn't perfect before pups go to their new homes and the buyer finds them or the buyer's veterinarian finds them. I won't make anyone take a puppy they don't want. If I get done with all the health testing and a buyer doesn't like the available puppy options – deposits are completely refundable.

Any questions about TVD please feel free to ask.

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