



## **BLOOD SCREENING TESTS OFFERED FOR HEART DISEASE & CANCER.**

**By JP Yousha**

In recent years advances in biotechnology have resulted in many new rapid and relatively inexpensive screening tests for various diseases and genetic conditions available.

Some have been wildly successful, such as those for coat color and eye diseases like PRA. However a test has to be specific to a disease/genetic condition to be of general value. Below is a review of two non-specific tests, one for cancer, the other for heart disease, that simply do not have a general application to screen for disease as many may have thought.

### **Pro-BNP HEART TEST**

Marketed by Idexx as CardioPET ProBNP, many have been misinformed that this simple blood test can be used as a "baseline" for heart disease in a potentially at-risk dog, and some are even being told they can screen for heart disease in their breeding stock using this test. Neither is true. And, except for very specific situations (which I outline below), this test really has little value for our breed at this time.

ProBNP is a non-specific blood test for non-specific heart disease. It measures a certain compound (NT pro-BNP) found at elevated levels in the blood when the heart is undergoing stress: specifically the cells in a heart in distension release more of this chemical to help regulate abnormal blood volume and pressure. So this test can only diagnosis congestive heart failure (advanced heart disease), which is essentially where every compromised heart (for whatever reason) ends up. It cannot clear a dog for diseases like DCM and SAS, and, in fact, a dog could have had several echocardiograms where heart disease was amply evident, while still getting "clear" results on a ProBNP. It cannot tell you or your veterinarian what KIND of heart disease your dog has either. So a follow-up examination by a cardiologist is going to be necessary if you get a positive BNP. And a negative BNP cannot be interpreted as the dog having a healthy heart.

ProBNP was created as an inexpensive alternative to the more specific diagnostic tests for heart disease, especially those that require a referral to a specialist. The idea was to aid the average practicing vet with the pet clientele unwilling, unable or unconvinced about doing more viable diagnostics where heart disease is suspected. It's a fairly new tool, so quite naturally a lot of veterinarians are eager to try it out, see how useful it might be for their own individual practice. And it certainly has its uses, but they are very limited in dog breeds like ours where hereditary heart disease is at issue.

IDEXX created this test to catch overt (clinically significant) heart disease earlier on in theory, so as to be able to manage the disease more effectively. But its only current use, other than in emergency medicine, is to see how effective therapy for such as congestive heart failure is once instituted. In other words, if you had a Dane already diagnosed with a specific heart condition, then ProBNP might be used to gauge how effective that treatment is. But otherwise its current use is very limited and the test has very little relevance for breeds such as the Great Dane.

It cannot define what kind of heart disease the dog has. The dog could have heartworm disease or DCM and the test results would be the same: negative in the early stages and positive when the dog has end-stage heart disease. It cannot diagnose heart disease until the disease is fairly advanced. So once you get a positive ProBNP result, you are going to have to go do the normally recommended tests (such as an echocardiogram) to diagnose specific heart disease. And a negative ProBNP has no real meaning at all beyond being able to say the dog doesn't have advanced heart disease; he could still have undiagnosed heart disease. So a "clear" on this test cannot be used (as an echocardiogram can) to claim the dog in question currently does not have heart disease.

Rationally it make more sense for most of us in Danes to get routine heart exams (auscultation with ECG, other follow-up as suggested) done on our dogs, and to have annual echocardiograms done whenever possible--at least every other year on adult male Danes is especially critical. Less than this sort of screening plan is frankly going to miss both the earliest signs of any heart disease, as well leave undiagnosed the most significant forms of heart disease. And an echo done BEFORE a dog has clinical signs of heart disease can reveal "occult" heart disease at the best time to start treatment. Note at this stage the dog would still test negative on this CardioPET ProBNP. Which also means, without routine exams involving echocardiograms, the breeder will have less time to intervene in the potential spread of something like DCM in their bloodline.

Since this blood test has no specificity, and has no predictive value, it just doesn't have a wide applicability, especially in a breed like ours. If dealing with a high risk individual/family, there might be some relevance to using CardioPET in between more specific screenings. If in a remote area, it might make to add in this test in an attempt to gain more data than just an auscultation done by an average practitioner. If on a budget, it might be added in to a plan to space out echocardiograms. But the catch there is that it could then give the breeder or owner a false sense of security, because the proBPN test only records end-stage heart disease, where the heart is already compromised, and in doing so, it cannot tell you what sort of disease caused the heart failure.

As a SCREENING test the value of CardioPET ProBNP is VERY limited: so with Great Danes it would simply be better to budget for better (more effective)

testing 99% of the time, as the take-home message is, by the time the ProBNP can register a Dane's heart disease, the dog is already experiencing congestive heart failure. By then there are few options left for the dog and when hereditary disease is involved, precious time to amend a breeding program has been lost.

## **VDI-TK-Canine CANCER TEST**

Marketed by the Veterinary Diagnostic Institute, the TK-Canine test is currently being promoted as a “dual marker” test that can confirm suspected cancer, affirm known cases of cancer and offer peace of mind to owners (by testing their pets and receiving a negative result). The last claim is perhaps the most hollow one, but this is another non-specific test that currently has little practical value in the majority of situations where cancer is a concern in our dogs.

TK is short for thymidine kinase, an enzyme present at elevated levels in some cancers, such as lymphoma and hemangiosarcoma. CRP is short for C-reactive protein and is a non-specific marker, a molecule found whenever inflammation is present. So for all both substances are being tested for, it seems a marketing tool to refer to this as a “dual marker” test as the presence of CDP is not an indicator of cancer per se. To date the presence of TK has poor predictive value of a relapse in dogs with established cancers such as lymphoma, poor differential diagnostic value for cancers such as hemangiosarcoma, and there is no evidence at all that TK screening is a useful predictive tool.

The test is being marketed as a “well dog” screening tool. Imagine the sequence of events that would result if you received a “positive” result on the TK-Canine test? Follow-up diagnostics, which are as likely as not to end in a confirmation yours is a healthy dog, could involved quite a bit of time and money, plus there is the immeasurable worry involved while going through this whole process. If follow-up diagnostics were to indicate the presence of cancers, little still would have been gained, as the TK-canine has a narrow predictive “window” (in other words clinical signs of illness would have quickly become apparent). What use does the test then have? It would appear to be a useful indicator of remission in lymphoma; high levels of TK would indicate the need for another round of chemotherapy, for example. So, again, it's use is limited to checking if a dog diagnosed properly using other tests is currently responding well to treatment.

## **SUMMARY**

There was a time most pet owners took their dogs in to the vet's office once a year for shots and got a check-up. Right now what exactly constitutes a suitable annual “wellness check-up” for a healthy pet is in question. Various laboratory tests are being marketed to both veterinarians and owners as part of this annual exam. So in this “new age” of many forms of “testing” available, we shall all have

to become more savvy to sort through not just the more useful and less useful tests for the specific animals in our care, but gain a sophisticated understanding of the limits of any diagnostic or other screening tests we choose to employ.

We all want to take the best care of our animals. Always. So the idea of “pre-screening” & “early detection” for disease has a lot of appeal. But tests have to test for something useful and they must do it in a clear and precise way to lend meaningful results. So when it comes to any sort of diagnostic screening test (a test for a disease), the most important question to get answered by your vet is: “what will I gain practically for my pet in knowing the results of this test?” If the answer is “not much” then the test isn’t going to be worth your time and money.



**K9 Abbreviated CURICULUM VITAE: JP YOUSHA**

Telephone: (432) 684-8940 Email: [jpy@chromadane.com](mailto:jpy@chromadane.com)

A 5th generation Texan, JP Yousha grew up with horses, dogs and all sorts of other critters, and then spent half her life living with them in various European locations.

Starting out as a teenager first showing and breeding horses, then later working particularly with German Shepherd Dogs and other working breeds, she combined her interest in dogs and horses in the late 1980s and became a dedicated enthusiastic of the Great Dane. She returned to the USA in the early 1990s where she now exhibits, trains, and breeds dual-ring, working-style Great Danes under the kennel name CHROMA. Always torn between a deep and abiding passion for both biology and art, she has pursued her interests in both -- academically and vocationally--holding a variety of degrees in both and having worked in both fields. She's a member of various local dog clubs and the national breed club and serves regularly in a variety of club officer and committee positions. She devotes most of her time these days to non-profit organizations specializing in the human-animal bond. She has written extensively on various health and welfare topics, particularly those involving the genetics of coat color and disease in the Great Dane.