

Inherited Myopathy of the Great Dane (IMGD)

Affected breeds: Great Dane

IMGD is an inherited condition found in Great Danes which results in muscle weakness and exercise intolerance. At birth the puppies appear normal, but from about two weeks of age they begin to lose weight. By 6 months they develop an awkward movement and become weak due to poor muscle strength. Although the condition is not fatal, it is a serious debilitating disease which requires on-going treatment and should be avoided at all costs.



IMGD is caused by a recessive genetic mutation. This means that dogs which carry the mutation ("CARRIERS") are normal but will pass the mutation on to an average of 50% of their offspring. Puppies which inherit two copies of the mutation will develop IMGD ("AFFECTED").

This test is particularly useful for breeders:

- To identify carriers among their breeding stock so that they can avoid CARRIER X CARRIER mating combinations which would risk AFFECTED puppies.
- To conclusively confirm IMGD in an affected dog

This test will be reported as:

CLEAR : no evidence of the IMGD mutation
CARRIER : carries one copy of the defect, which will be passed to 50% of offspring
AFFECTED : carries two copies of the defect, causing IMGD

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated:

AFFECTED X AFFECTED = 100% AFFECTED
AFFECTED X CARRIER = 50% AFFECTED, 50% CARRIER
CARRIER X CARRIER = 25% AFFECTED, 50% CARRIER, 25% CLEAR
AFFECTED X CLEAR = 100% CARRIER
CARRIER X CLEAR = 50% CARRIER, 50% CLEAR
CLEAR X CLEAR = 100% CLEAR

References

Böhm, J., Vasli, N., Maurer, M., Cowling, B. S., Shelton, G. D., Kress, W., Toussaint, A., Prokic, I., Schara, U., Anderson, T. J., Weis, J., Tired, L., & Laporte, J. (2013). Altered splicing of the BIN1 muscle-specific exon in humans and dogs with highly progressive centronuclear myopathy. PLoS genetics, 9(6), e1003430.