Sensory Neuropathy

Affected breeds:
Border Collie

Sensory Neuropathy is a neurological disorder in which the sensory, and later motor nerves degenerate. This results in a progressive loss of coordination of the limbs, and knuckling of the paws. There is also an insensitivity to pain. Excessive licking and chewing - of the paws in particular - due to lack of feeling, can lead to self-mutilation injuries. Other signs such as incontinence and regurgitation have been seen.

The condition becomes evident by 2-7 months. The outlook for affected dogs is bleak with euthanasia being the only option as the condition progresses.

Sensory Neuropathy 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 Sensory Neuropathy ("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 Sensory Neuropathy

This test will be reported as:
CLEAR : no evidence of the Sensory Neuropathy mutation
CARRIER : carries one copy of the defect, which will be passed to 50% of offspring
AFFECTED : carries two copies of the defect, and will have Sensory Neuropathy

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated:
CLEAR X CLEAR = 100% CLEAR
CARRIER X CLEAR = 50% CARRIER, 50% CLEAR
CARRIER X CARRIER = 25% AFFECTED, 50% CARRIER, 25% CLEAR

References
An Inversion Disrupting FAM134B Is Associated with Sensory Neuropathy in the Border Collie Dog Breed. Forman OP, Hitti RJ, Pettitt L, Jenkins CA, O'Brien DP, Shelton GD, De Risio L, Quintana RG, Beltran E, Mellersh C. G3 (Bethesda). 2016 Sep 8;6(9):2687-92. doi: 10.1534/g3.116.027896