

## ROYAL VETERINARY COLLEGE AND CLUMBER SPANIEL BREED CLUB IVDD SURVEY

An intervertebral disc disease (IVDD) owner questionnaire was developed by Dr Rowena Packer and colleagues at the Royal Veterinary College to support the Clumber Spaniel breed in identifying the incidence of IVDD in the breed and possible contributing factors. In total responses were available from 205 owners, representing 204 dogs in total. Most dogs originated from the UK (n=108), followed by Australia (5), Germany (4), Sweden (3) and the Isle of Man (2).

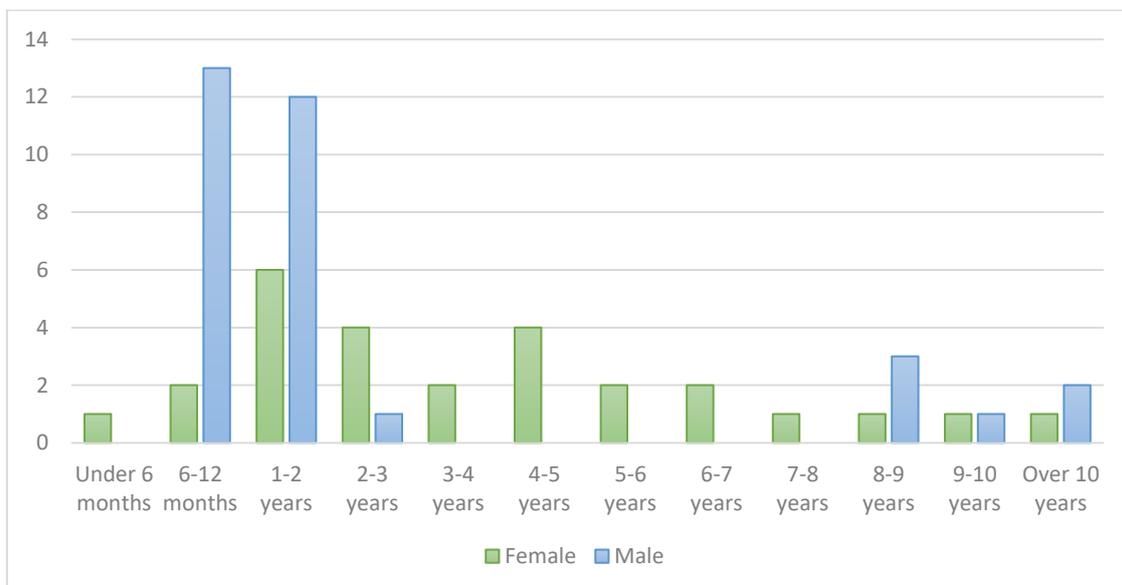
The below analysis has been split into sections and reports on the complete responses received for that question.

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### Sex, neutering and breeding status

Sex and neuter status was supplied for 176 dogs, of which 92 (52.3%) were female and 84 (47.8%) males. Of these, 27 bitches (29.3% of females) were neutered and 31 males (36.9%) representing 33.0% of the total dogs included. Some 59 dogs had the age at neutering provided, with the split between sexes provided in the figure below. There was no significant association found between neuter status, nor age at neutering, and IVDD status.



*Figure 1: Age at neutering for the 59 dogs reported as having been neutered.*

The majority of Clumbers reported in this survey were bred by the respondent (32.3%), followed by KC Assured Breeders (25.0%), show breeders (16.9%), working breeders (12.9%), hobby breeders (8.9%),

imported (2.4%), and rescued (1.6%). Most dogs were bred in the UK (n=111, 54.4%), with some 13 (6.4%) bred overseas, and 80 (39.2%) not-specified.

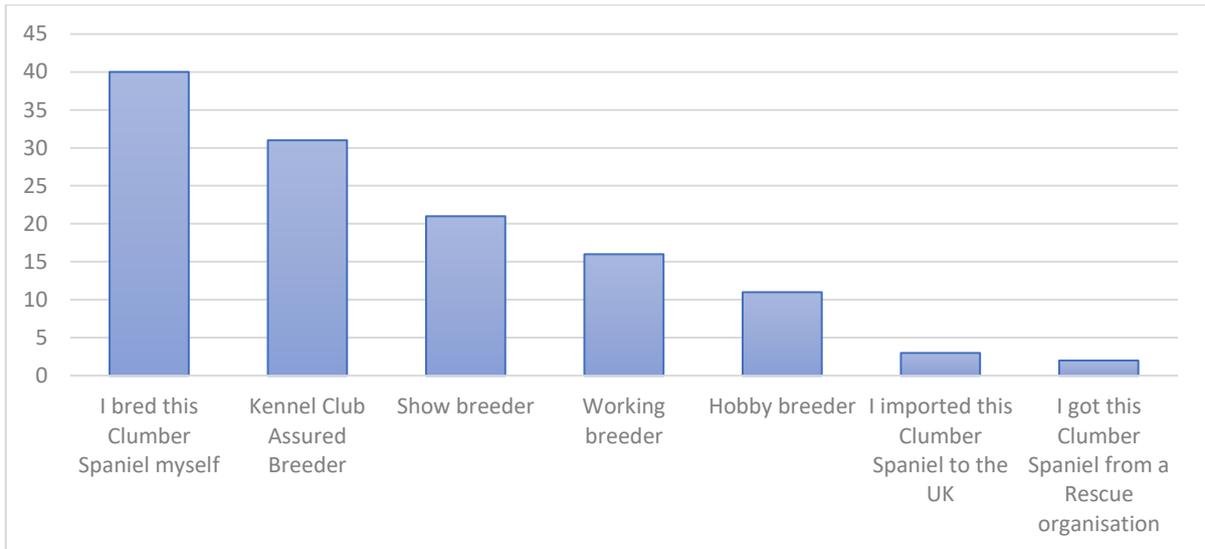


Figure 2: Where owners sought their dog(s) from.

Of the 124 owners who reported the age of the dog when they brought them home, 40 (32.3%) had bred the dog themselves and owned from birth, 30 (24.2%) at eight weeks of age, 22 (17.7%) between nine and 10 weeks, and the remaining 21 (16.9%) other. "Other" ranged from 16 weeks of age to 16 years.

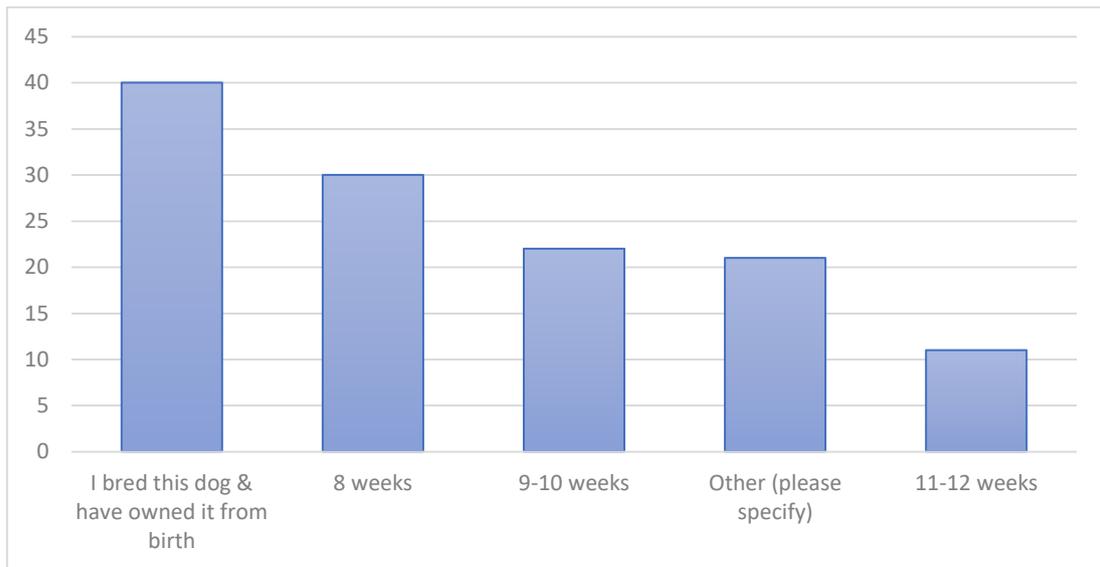


Figure 3: Age at which owners brought their puppy home.

Overall, some 178 owners reported whether their dog had been bred from or not, of which 130 had not been used in breeding (73.0%), 26 had sired or whelped one litter (14.6%), 10 two litters (5.6%), nine three or more litters (5.1%), one an unknown number of litters (0.6%), and two "don't know" (1.1%). This breakdown is given in Figure 2 below.

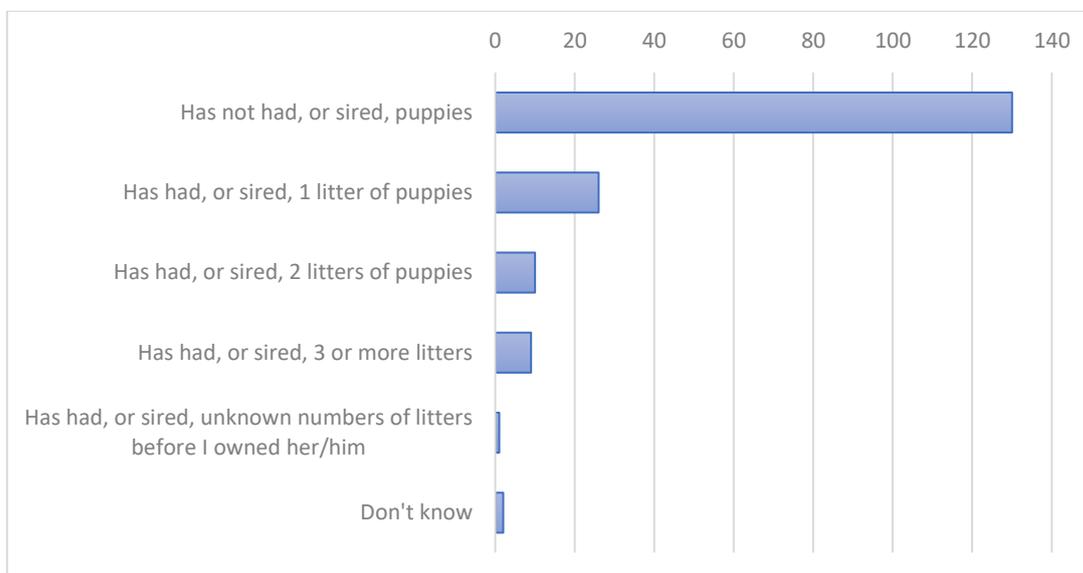


Figure 4: Count of dogs bred from and number of litters per dog.

Of the 33 IVDD affected dogs reported in this survey 23 had not been bred from, two unspecified, and the remaining eight having sired one litter (n=7) or two litters (n=1).

In terms of family history and whether owners were aware if any relatives of their dogs had been affected, of the IVDD affected dogs, 17 owners were unaware of any family history, 13 reported their dog to have had brothers/ sisters also affected, five dogs also had an affected dam, and one dog had a sire also affected.

### IVDD status

Of 204 dogs that were reported for 171 (83.8%) were free from IVDD diagnosis at the time of responding, and 33 (16.2%) having been diagnosed or presumed to be affected due to showing clinical signs.

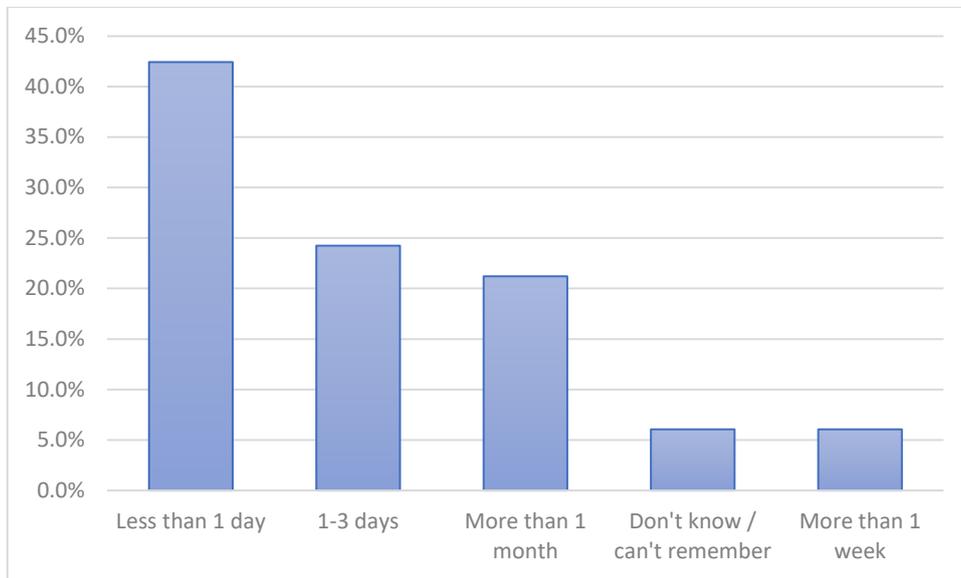
In total 38 dogs had been reported to have displayed signs of IVDD (including pain in the neck, back or abdomen, weakness, wobbliness, unwillingness to move, and paralysis of front and/or hind legs), three “don’t know”, 63 unspecified and 100 no signs of disease. The reported clinical signs are shown in Table 1 below, with the most common being shivering, panting or crying. The median age at clinical signs was 4.8 years (IQR 2.1) for the 27 dogs where age at presentation was reported.

Table1: Reported clinical signs in IVDD affected dogs.

Reported clinical signs	Count
Shivering, panting or crying	18
Unwilling to move, jump or climb stairs (if allowed)	16
Pain when their neck or back was touched	14
Unable to stand	14
Unable to walk	11
Weakness/wobbliness in hindlimbs (e.g. legs crossing, splayed out, stumbling and/or knuckling over)	11
Other	9
Unable to urinate	5
Weakness/wobbliness in forelimbs (e.g. legs crossing, splayed out, stumbling and/or knuckling over)	5

Other included: ability to walk but sitting down frequently, physical dip in spine, extreme pain when standing up, head held to one side and unsound, licking of shoulder, pain/ stiffness, favouring a forelimb.

Of the 33 dogs reportedly affected, the majority of dogs showed onset of clinical signs in under a day (42.4%), with the remaining period of onset shown in Figure 5 below.



*Figure 5: Period of onset of IVDD clinical signs in affected dogs.*

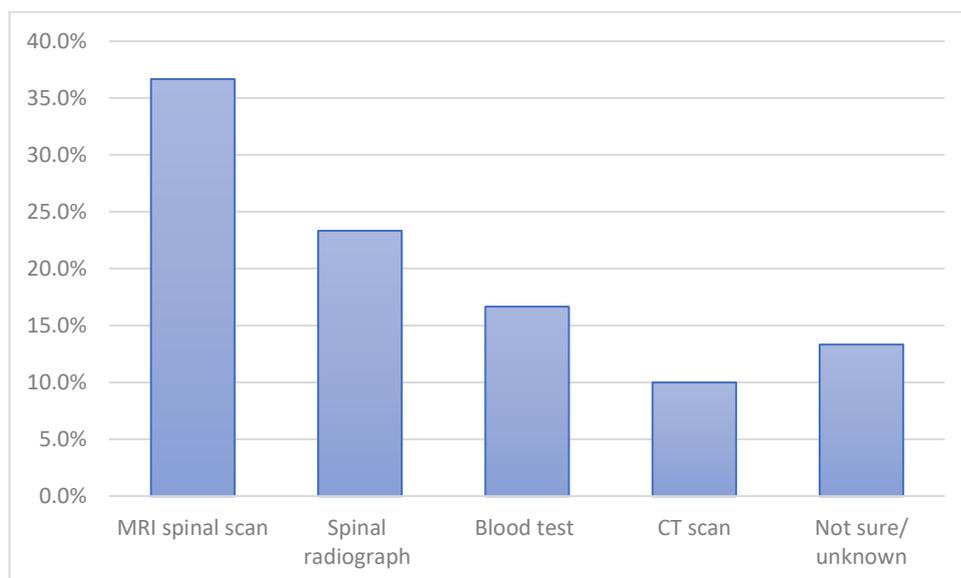
Ten owners reported possible incidents that could have triggered their dog's disease onset, with these including accidents such as collision with another dog/puppy, slipping on a wooden floor, collisions with hard surfaces, and working injuries (i.e. field trials, agility).

Thirty-two dogs had the number of episodes reported for, with 19 having had one episode, six two episodes, and seven three or more episodes. Eight dogs had their age at subsequent episodes reported, with a range in 0.0 to 6.25 years.

Of 33 dogs where diagnosis method was provided, most were diagnosed through their local vet and a referral vet (36.4%), 11 by their local vet only (33.3%), and 10 with no veterinary diagnosis (30.3%), but a presumptive diagnosis from the owner given the clinical signs seen. Fourteen were found to have the defective disc in their neck, 13 in their back, and nine unknown/ not sure.

Specific areas were reported for 13 dogs, of which seven dogs had their cervical vertebrae affected (two dogs unspecified, two C1-C2, two C3-C4, one dog multiple sites: C4-C5, C5-C6, C6-C7, C7-T1), three dogs lumbar vertebrae (unspecified), and three thoracic (one unspecified, one T9, one T11-13).

Diagnosis was confirmed for 30 affected dogs, with the method for these provided in the figure below.



*Figure 6: Method of diagnosis in IVDD affected dogs.*

A total of 34 dogs had treatments reported for, with the most common option being cage rest and medication (11 dogs). The remaining treatment options are shown in Figure 7 below.

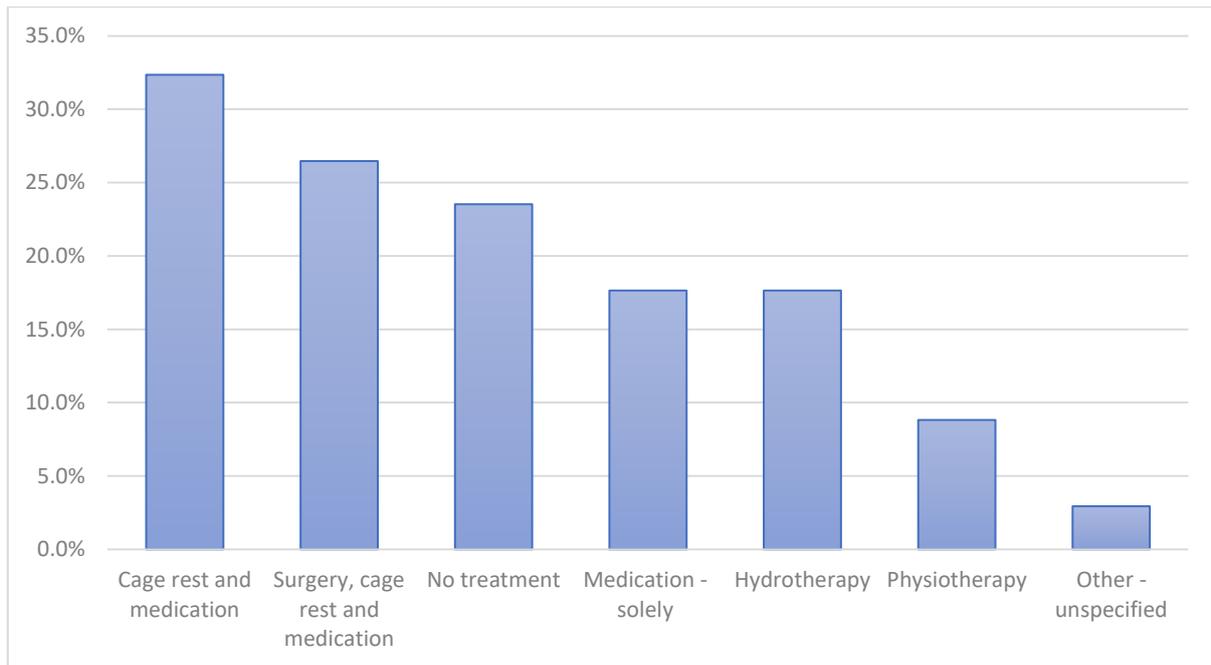


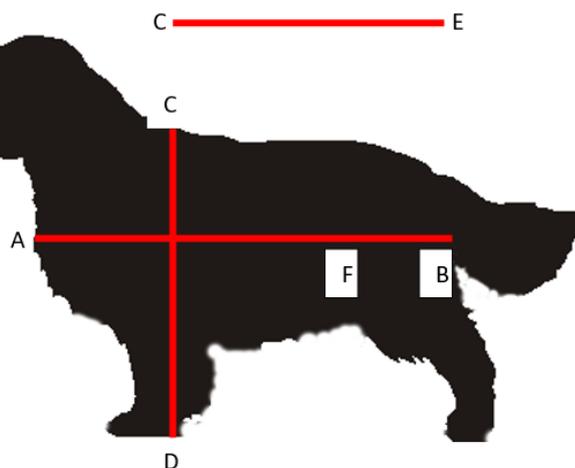
Figure 7: Treatment options for IVDD affected dogs.

In terms of success of recovery, 18 dogs were said to have a full recovery, eight were euthanised, five were able to walk but with small abnormalities/ difficulties in how they walk/ move, and one able to walk but with significant abnormalities/ difficulties in walking/ moving.

### Size measurements

Owners were asked to report on the following of their dog's size measurements in centimetres:

- Forechest to bottom (A to B)
- Withers to bottom (C to E)
- Forechest to last rib (A to F)
- Withers to ground (foreleg) (C to D)
- Ribcage circumference (C to C)



In total 12 IVDD affected dogs were recorded for and 67 unaffected dogs, with the values reported given in Figure 8 below. The relative body length (back length: height at withers ratio/ BL:HW) of the affected group

was 1.17 and unaffected 1.20. There was no significant difference found between any of the parameters between IVDD-affected and unaffected dogs, but it is worth noting that the sample sizes were small.

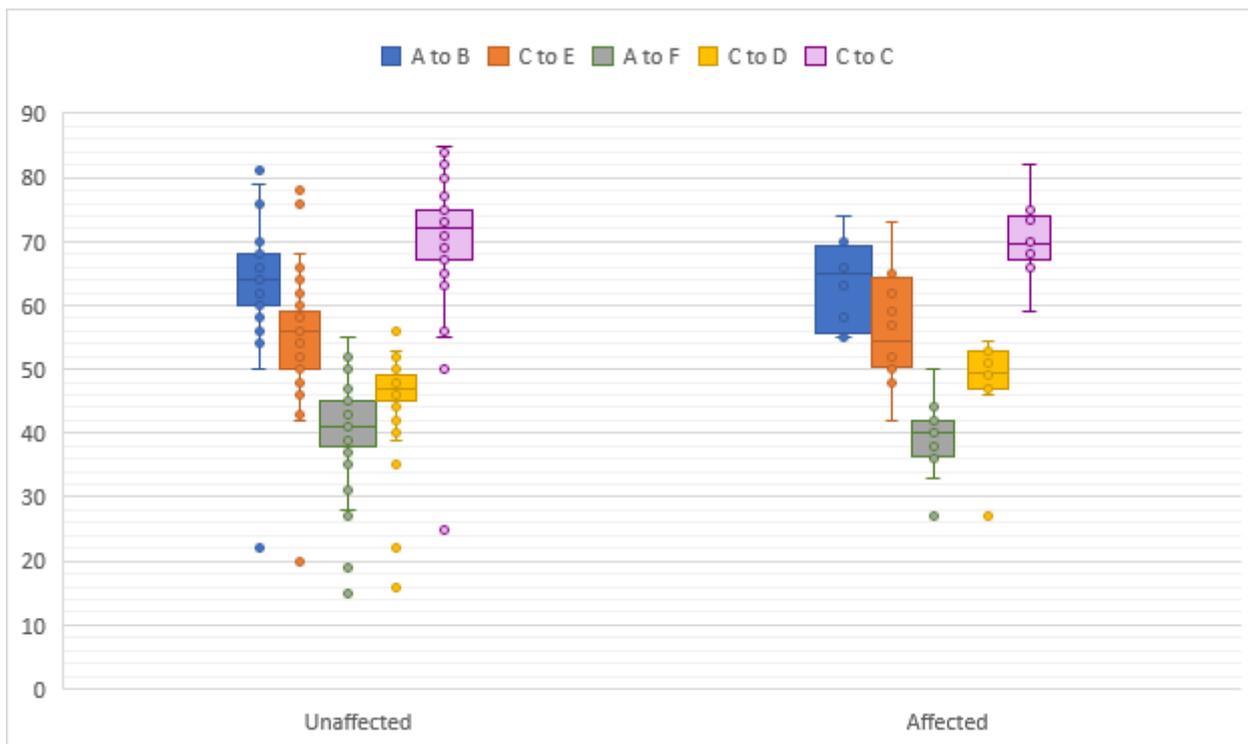


Figure 8: Size measurements recorded by owners in centimetres.

Owners were asked to report their dog's estimated body condition score (5-point scale) at the time of diagnosis. The criteria for each score is bullet pointed below.

- 1: You can feel his ribs, spine and pelvic bones. There is an obvious abdominal tuck-up, when viewed from the side
- 2: You can easily see his ribs, spine and pelvic bones. There is a slight abdominal tuck-up, when viewed from the side
- 3: You can easily feel his ribs, but they are not visible. There is an obvious waist behind the ribs, when viewed from above
- 4: You cannot feel his ribs and can see some fat over his back. There is no discernible waist behind the ribs, when viewed from above and no abdominal tuck-up in profile
- 5: You cannot feel his ribs and can see fat on his neck, shoulders, over his back and the base of his tail. There is no discernible waist behind the ribs, when viewed from above and a distended underline, in profile

In total, 87 dogs were reported for in this section, 14 of which had been reported as IVDD affected and the remaining 73 unaffected. The majority of dogs (57.1% and 65.8% for IVDD affected and unaffected respectively) were reported as a grade 3. No significant difference was found in bodyweight between IVDD affected and unaffected dogs.

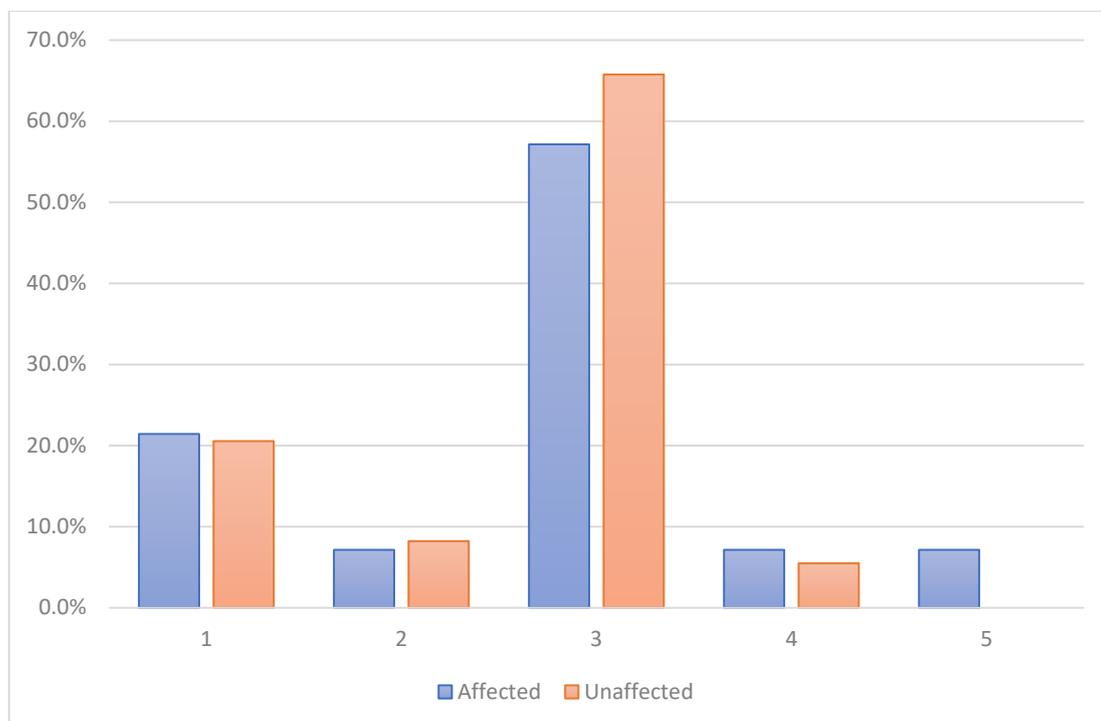


Figure 9: Body condition scores reported by owners.

## Activity

Owners were asked to report on the amount of exercise their dog had been given as a puppy, with the majority for both affected and unaffected dogs being the 5 minutes per month of age rule, although a higher proportion of affected dogs were seen to be walked to this rule. However, there was no significant difference between the amount of time walked and odds in developing disease.

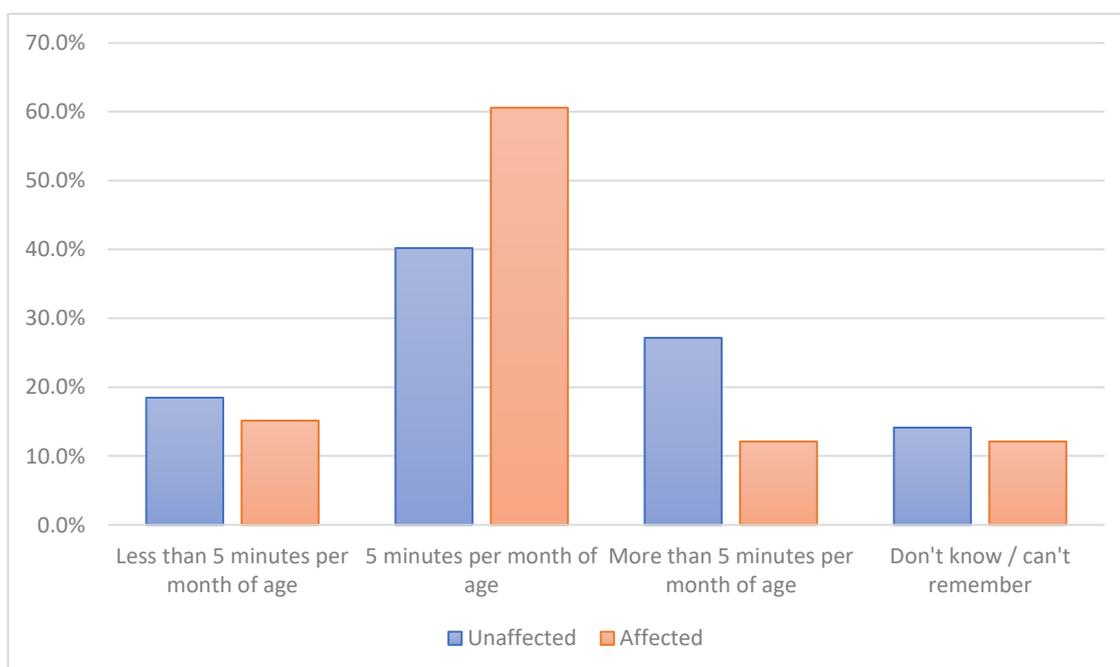


Figure 10: Amount of walking dogs received as puppies.

Owners were then asked to report on a series of questions regarding their dog's typical activity level in various scenarios before and after IVDD. Unaffected dogs are also included in the graphs below as a

comparison. However, it is worth noting that for IVDD affected dogs only respondents who reported their dog's activity before and after IVDD are included, and therefore numbers vary between scenarios.

With respect to playing in the garden per day, affected dogs (n=17), both pre and post IVDD, seemed to spend less time playing outside, with 63% of dogs pre-IVDD spending 30 minutes or less in the garden and 69% post-IVDD, compared to unaffected dogs (n=79) of which 62% spent 31 minutes or more playing outside.

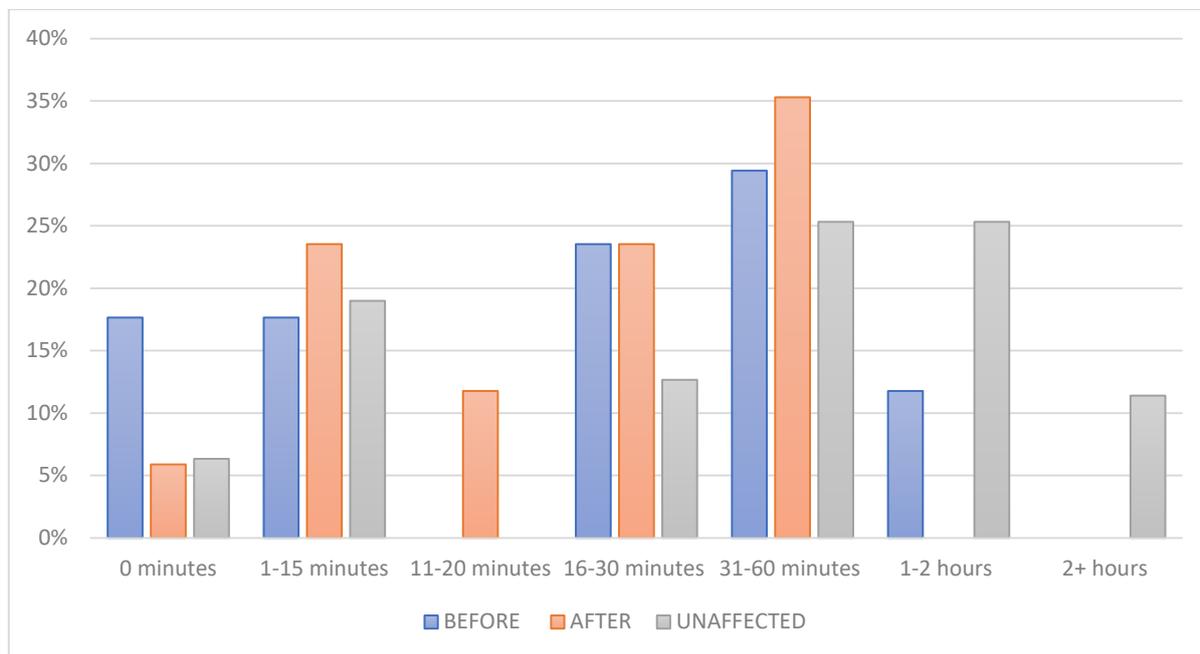


Figure 11: Amount of time spent playing in the garden in IVDD affected and unaffected dogs.

The next question looked at the amount of time spent being walked on a lead per day, with unaffected (n=87) and pre-IVDD affected dogs (n=23) being walked a similar amount of time (62% and 61% walked between 0 and 30 minutes a day respectively), and 74% of post-IVDD affected dogs walking less than 30 minutes a day on the lead.

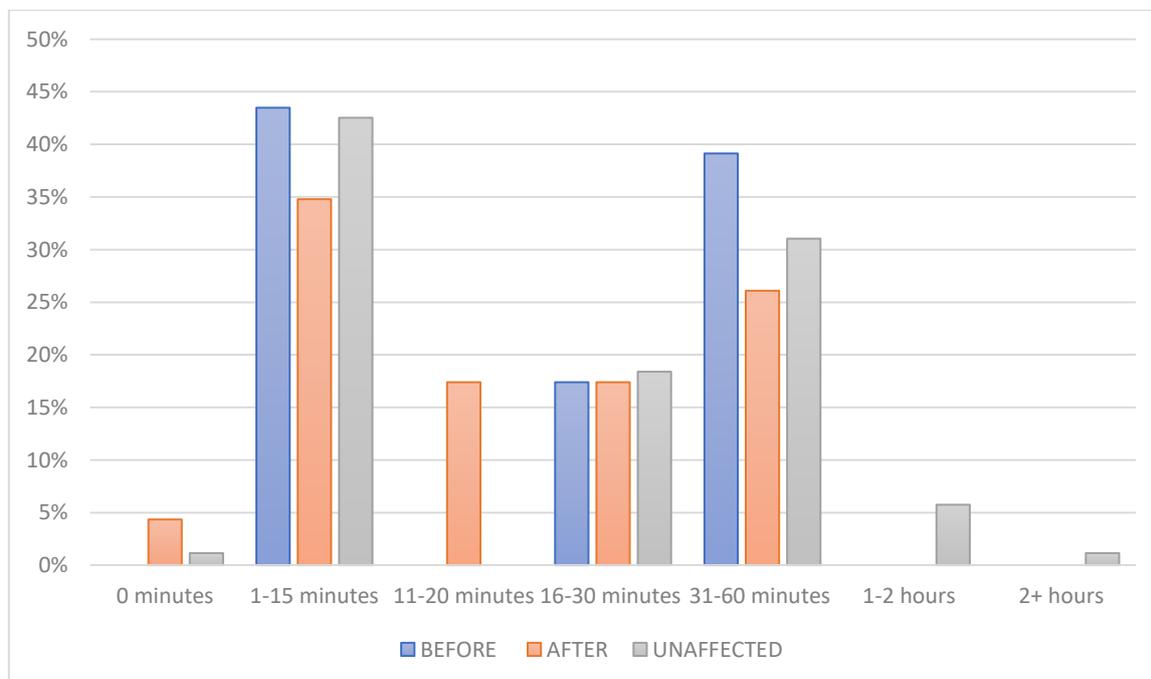


Figure 12: Amount of time spent being walked on the lead in IVDD affected and unaffected dogs.

When considering amount of time spent being walked off the lead per day, unaffected dogs (n=86) seemed to be walked for more time off lead, with 43% walked off lead for 31 minutes or more a day, compared to 30% of pre-IVDD affected dogs (n=23), and 26% of post-IVDD affected dogs. However, the majority of unaffected dogs (57%) were walked less than 30 minutes off lead.

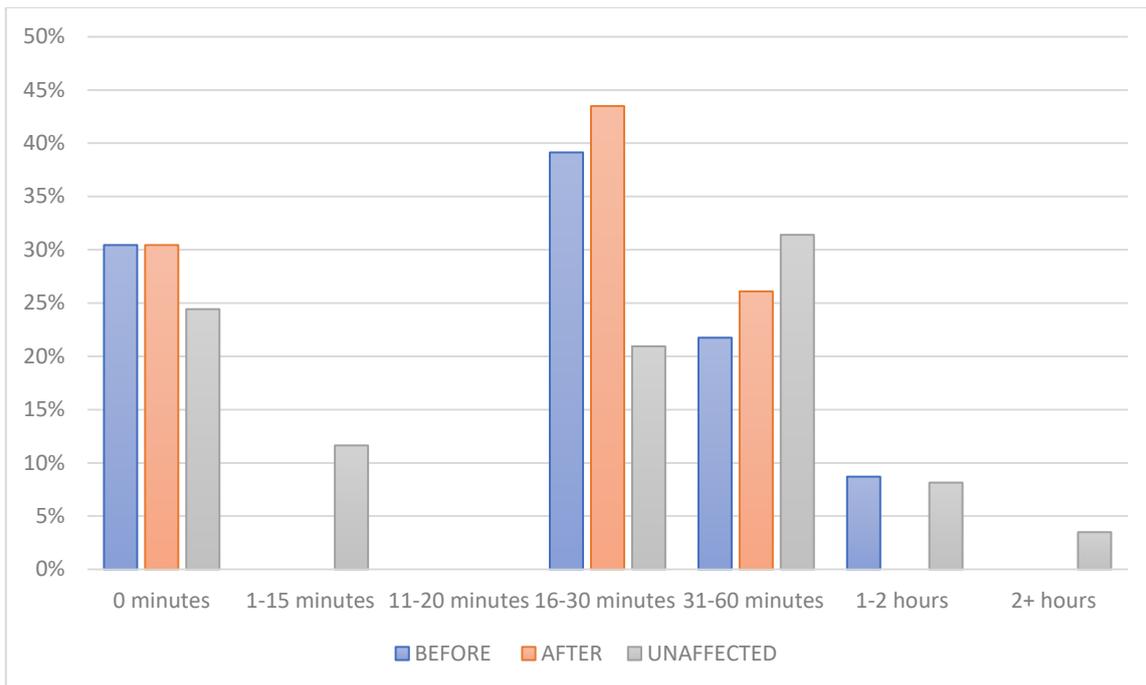


Figure 13: Amount of time spent being walked off the lead in IVDD affected and unaffected dogs.

With respect to working dogs, 44% of unaffected dogs (n=81) were reported to work, with most of these out in the field for over two hours a day. When looking at IVDD affected dogs (n=16), nine of these were reported to work pre-IVDD, with 31% spending two hours or more in the field, however in post-IVDD this dropped to 19%. It is worth considering that the respondent rate dropped for this question and so interpretation should be made with caution with respect to these results.

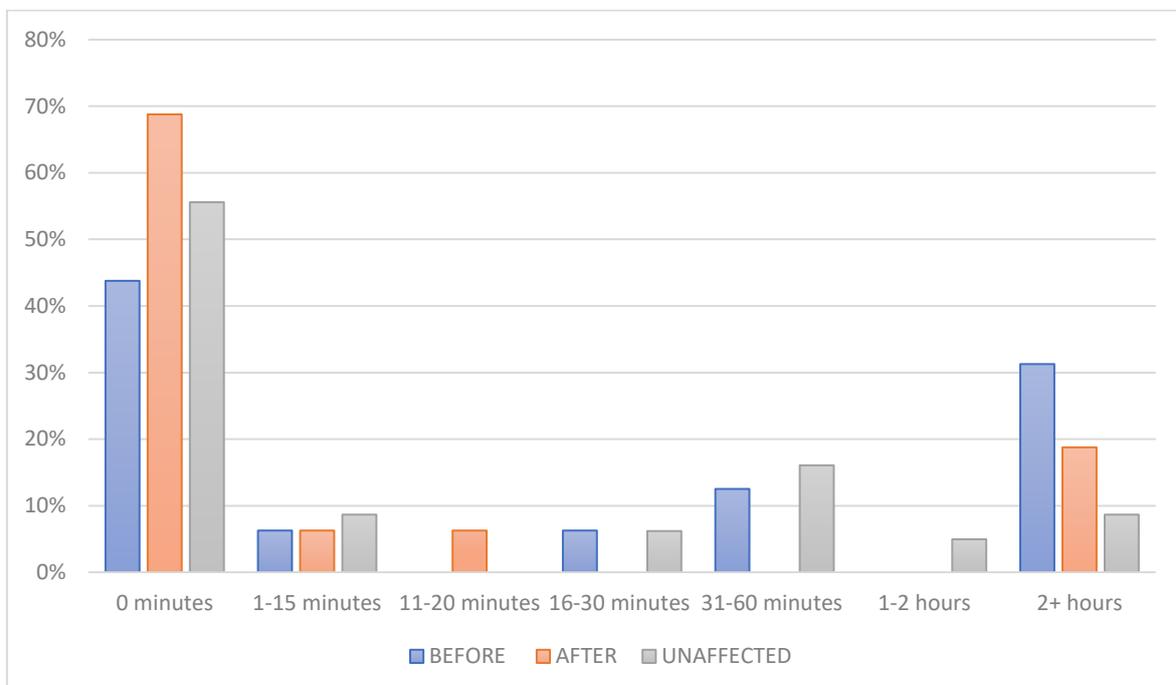


Figure 14: Amount of time spent being working in the field in IVDD affected and unaffected dogs.

Very few dogs were reported to go jogging or accompany their owners cycling for both unaffected and IVDD affected dogs, with just two reports of unaffected dogs going cycling/ jogging and one post-IVDD dog that spent an average of 11-20 minutes per day cycling/ jogging.



Figure 15: Amount of time spent jogging/ cycling in IVDD affected and unaffected dogs.

Owners were then asked to comment on their use of walking accessories with their dog before and after IVDD, with owners of post-affected IVDD dogs (n=27) seeming to prefer using a harness or slip lead instead of a collar. Given the above reports for affected dogs where specific vertebrae are recorded, this is perhaps not surprising as the majority of affected vertebrae were in the neck. Interestingly, the majority of owners pre-IVDD and in unaffected dogs (n=93) reported that they preferred using a slip collar.

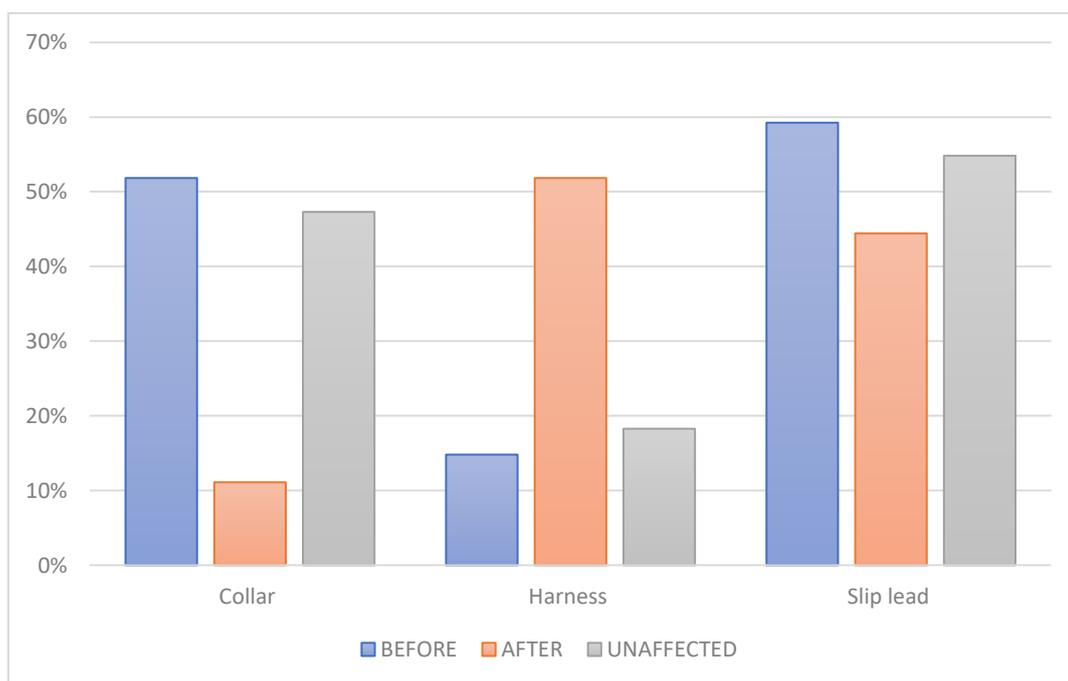


Figure 16: Preferred walking accessory reported by owners of IVDD affected and unaffected dogs.

In terms of how frequently dogs were reported to pull on the lead/ harness when being walked the majority of dogs in all groups were reported to pull “sometimes” (43% of unaffected, 46% of pre-IVDD and post-IVDD). It appears that post-IVDD affected dogs (n=26) were slightly less likely to pull, with 50% reported to “never” or “rarely” pull, as opposed to 39% of pre-IVDD affected dogs. In comparison, 48% of unaffected dogs (n=93) were reported to “rarely”/“never” pull. Similarly, pre-IVDD affected dogs seemed to pull more, with 16% reported as pulling “usually” or “always”, compared to just 9% of unaffected dogs. The one affected dog that was reported to “always” pull post-IVDD was also reported to do this pre-IVDD.

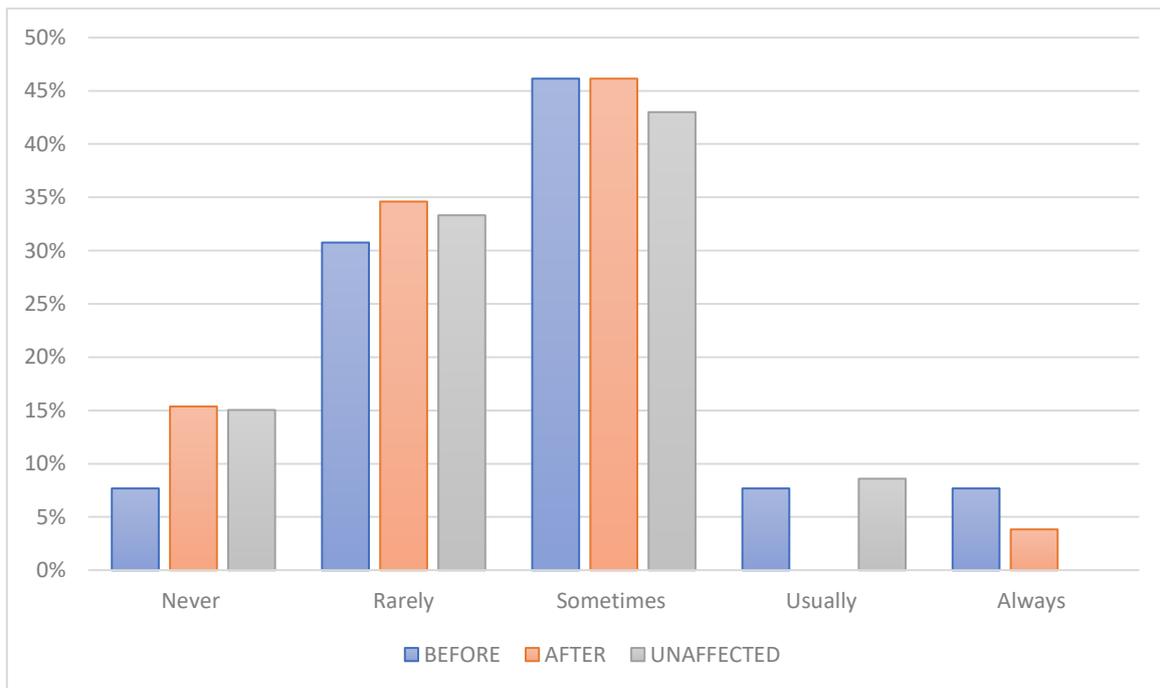


Figure 17: Owner responses when asked how frequently their dog pulls on the lead before and after IVDD.

In terms of overall activity before and after IVDD, post-IVDD affected dogs (n=15) were reported to be less active than before disease, with 87% reported to be mildly active, compared to 67% described as moderately active pre-IVDD, and 33% highly active pre-IVDD. In comparison the majority of unaffected dogs were reported as moderately active (58%, n=93).

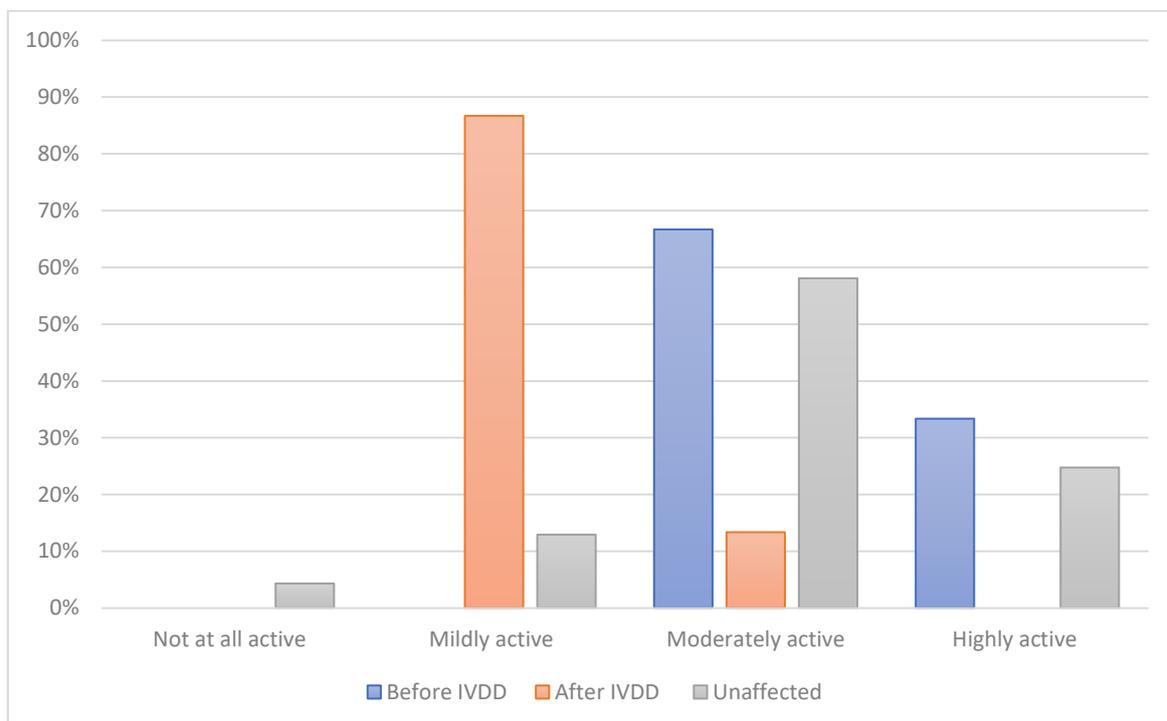


Figure 18: Owner perception of dog activity before and after IVDD.

Owners also reported on any canine activities that their dog was involved in before or after IVDD status; it appears from the below figure that following disease dogs were less likely to take part in high intensity sports such as agility and field work, as well as showing (it is worth noting that dogs that have undergone surgery are required to apply for permission to show, which may or may not be granted for IVDD cases).

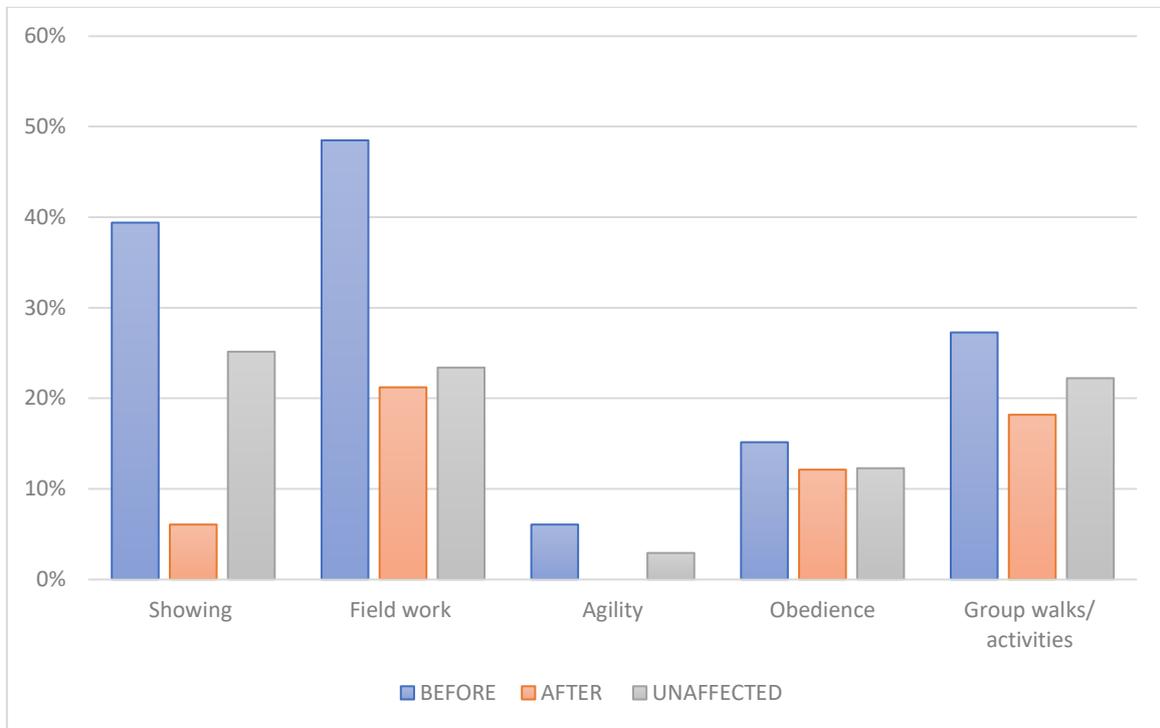


Figure 19: Participation in canine activities before and after IVDD.

## Environment

The next section looked at environment and where dogs spent most of their time during the day before and after IVDD. In total 27 IVDD affected dogs were reported for in this area, and 91 unaffected dogs. Post-IVDD dogs seemed to spend more time in restricted areas following an episode, with 32% being kept restricted to certain rooms within the house, 29% in an outbuilding with a run, and 11% kept in a dog cage/ crate. In comparison 22% of pre-IVDD dogs and 5% of unaffected dogs spent time restricted in certain rooms, and just 4% and 1% in dog cages/ crates respectively. With respect to outbuilding housing with a run, similar numbers were reported for pre-IVDD and unaffected dogs, with these being 30% and 22%.

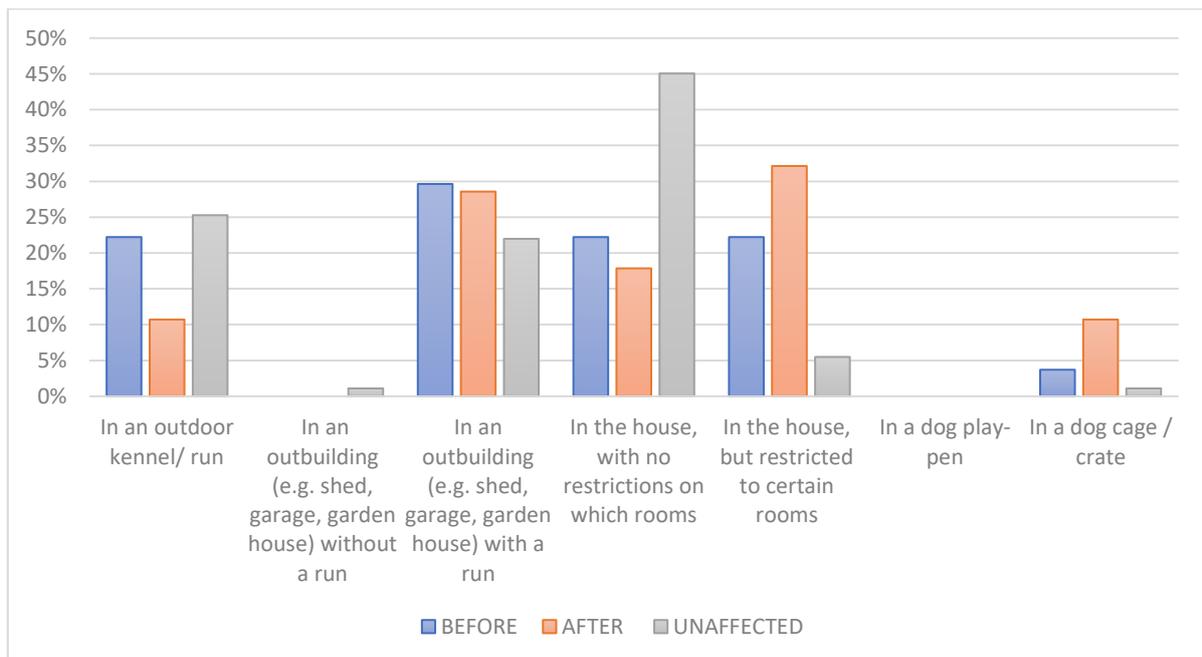


Figure 20: Where dogs spent most of their day before and after IVDD.

The following question looked at what company dogs had before and after IVDD. In total 27 IVDD affected dogs were reported for, and 92 unaffected dogs. It is worth noting that some dogs may have lived with a combination of sized breeds before and after IVDD. A similar proportion of dogs from both groups lived with other Clumber Spaniels, at approximately 60%. It appears there may have been a small decrease in the number of post-IVDD dogs living with medium/ large sized breeds, however this only accounts for four dogs.

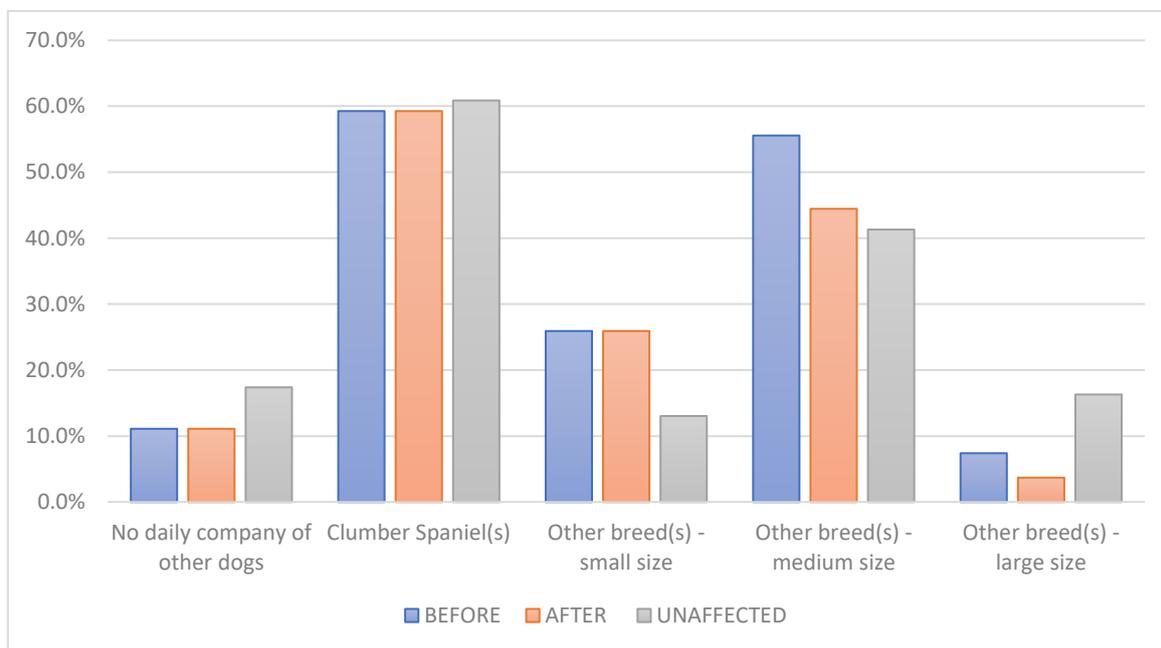


Figure 21: Company of dogs before and after IVDD.

Owners then reported on how frequently their dog used the stairs before and after IVDD, with the majority of post-IVDD dogs (n=27), 44.4%, not allowed to go up or down the stairs. Whilst there is a visibly higher proportion of pre-IVDD dogs allowed to use the stairs more frequently compared to post-IVDD, these are similar to unaffected dogs (n=92, 18.5% post-IVDD using a flight of stairs once per day compared to 13.0% unaffected, and 14.8% multiple times a day compared to 18.5% unaffected), and no significant difference in use prior to IVDD compared to unaffected dogs was found.

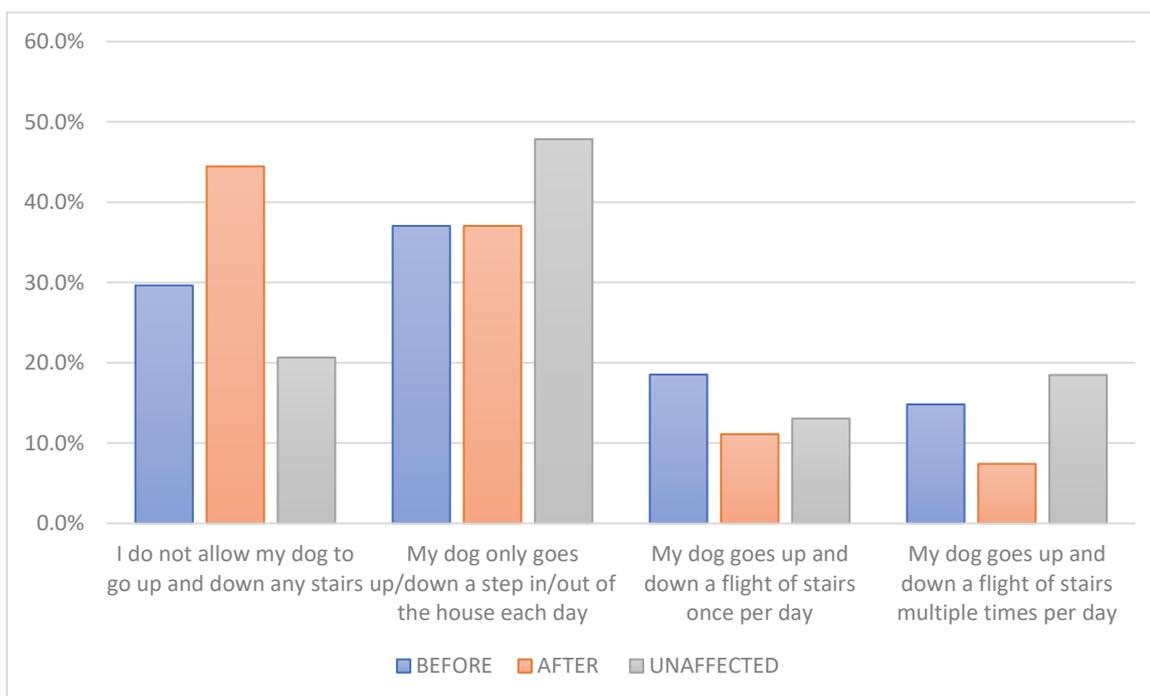


Figure 22: Frequency of going up and down the stairs before and after IVDD.

Similarly to the above, owners reported on how frequently their dogs jumped on or off furniture before and after IVDD. Twenty-seven IVDD affected dogs were reported for, and 92 unaffected dogs. Interestingly, more IVDD affected dogs, before and after disease, were not allowed to jump on or off furniture compared to unaffected dogs (48.1% and 51.9%, compared to 15.2% of unaffected dogs), whereas 47.8% of unaffected dogs were reported to jump on and off furniture every day (compared to 29.6% pre-IVDD and 25.9% post-IVDD).

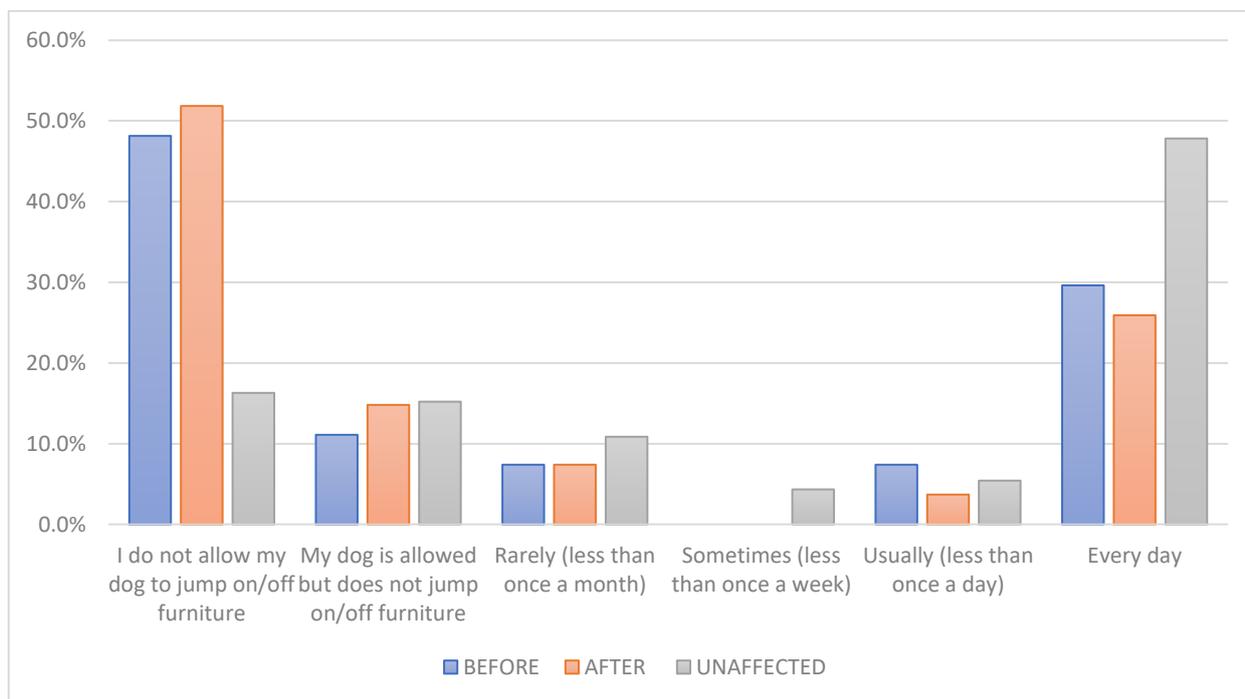


Figure 23: Frequency of jumping on and off furniture before and after IVDD.

## Diet

The final section looked at diet and what owners reportedly fed their dogs before and after IVDD. The majority of owners both for IVDD affected (n=26) and unaffected (n=93) fed their dogs a complete dry food, followed by raw/ BARF.

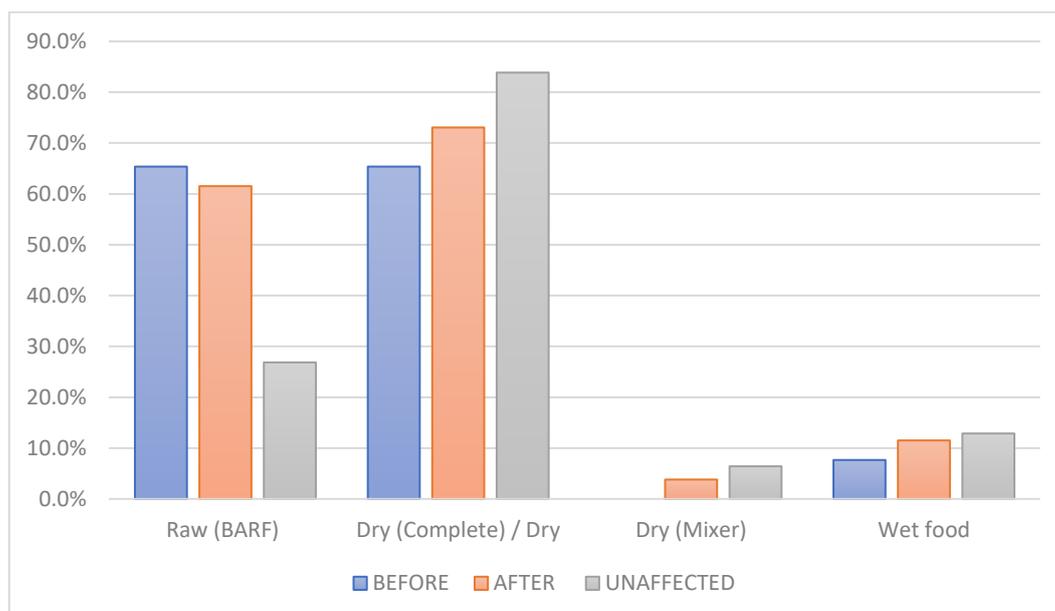


Figure 24: Choice of food reported for dogs before and after IVDD.

Some 15 affected dogs were recorded for this next question, and 44 unaffected dogs. Of these it appears that owners brought glucosamine into their dog's diet following IVDD status, although it should be noted that this is only eight dogs higher than pre-IVDD.

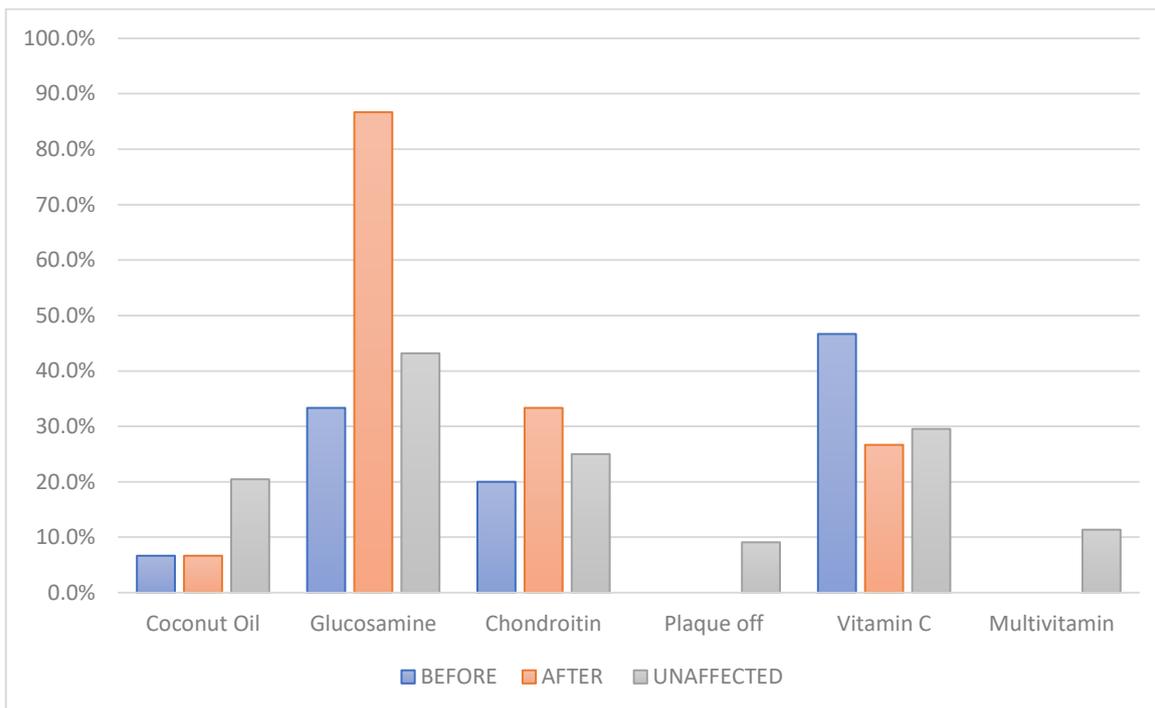


Figure 25: Choice of dietary supplements for dogs before and after IVDD.

Owners were also asked to report how frequently they fed their dog treats in addition to their normal diet, such as Dentastix, Schmackos, Bonios etc. For this question 25 IVDD affected dogs were reported for, and 93 unaffected. Interestingly a higher proportion of unaffected dogs were fed treats several times a day compared to affected dogs, and a higher proportion of owners reported that their affected dogs were never fed treats compared to unaffected dogs.

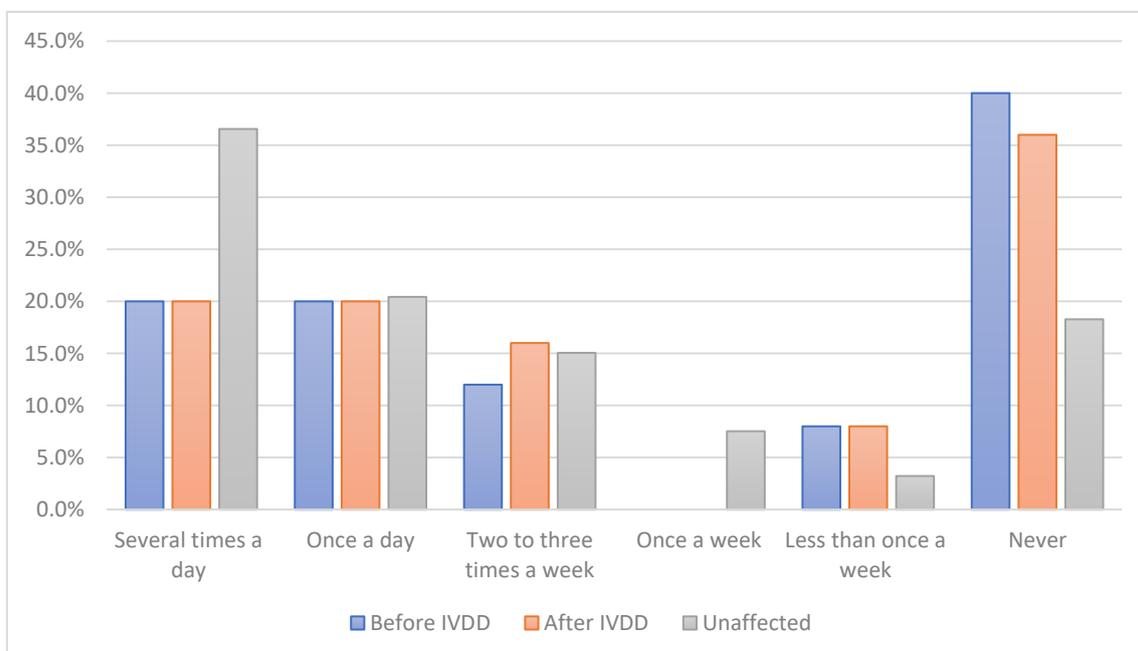


Figure 26: How frequently dogs were fed dog treats in addition to their normal diets.

The last question asked owners how often they fed their dog other treats in addition to their normal diet, such as human food or table scraps. The majority of IVDD affected dogs (n=25) were fed these treats once

a week (36.0%), whereas the majority of unaffected dogs never received these types of treats (n=90, 27.8%).

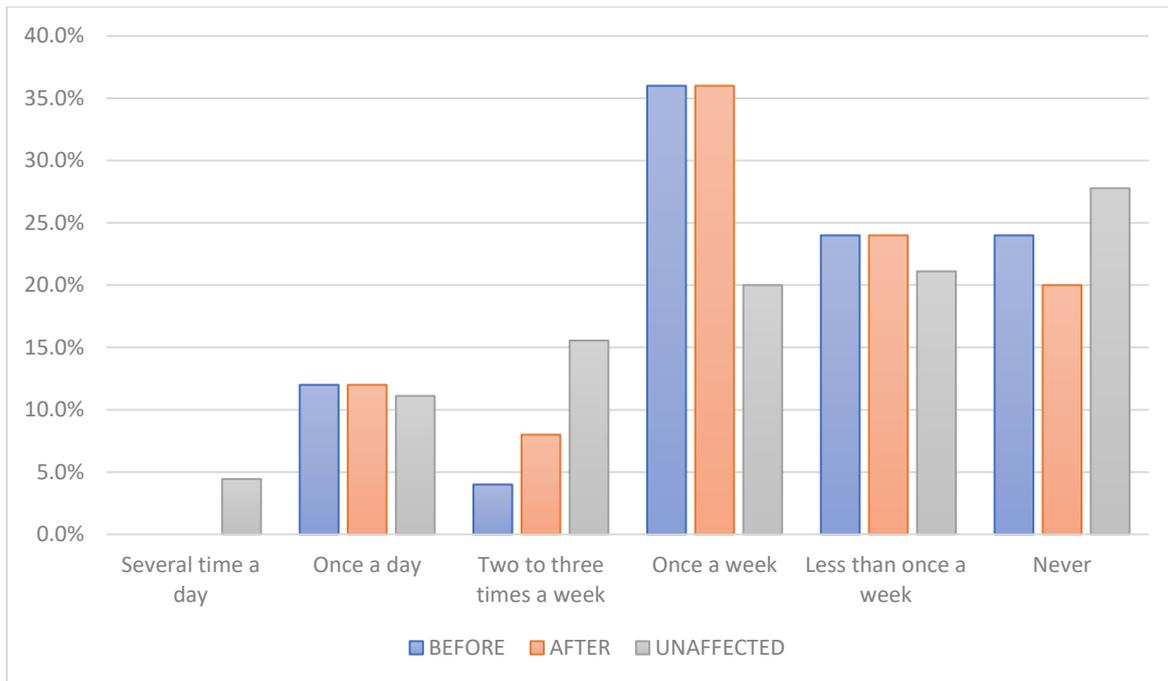


Figure 27: How frequently dogs were fed other dog treats in addition to their normal diets.

## Deaths

In total 59 dogs were reported to have been deceased at the time of their owner completing the survey, of which the most common reason was euthanasia due to a health condition (n=35, 59.3%), not specified (n=11, 18.6%), death due to a health condition (n=10, 16.9%), death following an accident (n=1, 1.7%) and due to natural causes (n=1, 1.7%). The top reasons for death provided are given in Table 2 below.

Table 2: Causes of death reported for deceased dogs.

Cause of Death	Count	%
Neurological problem - spine disorder (e.g. IVDD)	14	23.7%
Not specified/ blank	11	18.6%
Cancer	7	11.9%
Unknown	5	8.5%
Neurological problem - brain disorder (e.g. epilepsy)	4	6.8%
Old age	3	5.1%
Heart problem	3	5.1%
Musculoskeletal problem (e.g. arthritis, elbow or hip disease)	3	5.1%
Kidney problem	1	1.7%
Diabetes	1	1.7%
Abdominal	1	1.7%
Old age	1	1.7%
Combination - Musculoskeletal problem and skin problem	1	1.7%
Reproductive problem (e.g. pyometra, birthing problem)	1	1.7%
Combination - Gastrointestinal problem and diabetes mellitus	1	1.7%
Behavioural problem (e.g. aggression)	1	1.7%
Combination - Musculoskeletal problem and neurological problem - spine disorder (e.g. IVDD)	1	1.7%

The median age at death where details were provided (n=39) was 9.6 years (interquartile range 6.8 years, range 3.9 - 13.8 years).

The remaining 145 dogs reported for were noted as being alive at the time of completing the survey.

## Summary

In conclusion, the following points have been seen in this analysis:

- In total, 16.2% of dogs recorded for in this study had either been diagnosed with IVDD, or presumed to have been affected due to presence of symptoms, out of a total of 204 dogs.
- In terms of breeding, 27% of dogs had been bred from, including eight of the 33 IVDD affected dogs (presumably IVDD onset was after having been bred from).
- The most common symptoms seen in affected dogs were shivering, panting or crying, unwilling to move/ jump/ climb stairs, and pain in the neck/ back when touched.
- Over 40% of dogs had clinical signs appear within a day, however this spanned to up to over a month for some dogs.
- Overall, 19 of 33 dogs had just one episode of disease, but some dogs had as many as three plus.
- In terms of recovery, 18 of 33 were said to fully recover, with the most common treatment being cage rest and medication; however sadly eight dogs were euthanised due to disease and six whilst having recovered, were still affected with gait/ movement abnormalities.
- Unfortunately this analysis was unable to identify possible conformational differences between affected and unaffected dogs, but a larger dataset may have established this (it is known that dogs with shorter legs are more predisposed to IVDD).
- With respect to activity, no significant differences could be found between the amount of exercise dogs had as puppies, or overall activity as an adult, but again this could be due to the relatively small number of dogs in the study. Post-IVDD owners reported a change in lifestyle with their dogs, and were less likely to take their dog out for as long or intense activities as unaffected dogs, and opted for different walking equipment (e.g. moved towards harnesses over collars).
- Post-IVDD affected dogs were seemingly less active in comparison to pre-IVDD and unaffected dogs.
- Similarly to the above, owners appeared to opt to restricting their dog's movement around the house during the day following IVDD, and prevented them from using the stairs as frequently as before IVDD or for those that owned unaffected dogs.
- Overall, diet seemed to be fairly similar across both affected and unaffected dogs, although some owners opted to add supplements (i.e. glucosamine) to their dog's diet following IVDD.
- The most common cause of death was neurological disorder – spinal (however there will be a possible bias to this subset as this was an IVDD specific survey), followed by cancer, and unknown.