Hip Dysplasia - HD

Hip Dysplasia (often referred to as HD) is a common orthopaedic problem that can occur in all types of dogs - pedigree and crossbreeds. It affects the development of the hip joint during a puppy's growth phase – "dysplasia" means abnormal growth. In a normal hip, the head of the thigh bone (femur) fits deeply into the socket of the pelvis – dysplastic hips are loose-fitting causing the joints to be subject to excessive wear which makes the joint unstable. To compensate for this the body tries to re-establish stability by developing new bone which leads to pain and inflammation and often severely arthritic joints later in life.

This is a condition that can present in varying degrees and is generally bilateral, though it can sometimes affect only one leg. Signs of lameness generally start to appear when a puppy is about five months old – just at the time of the most rapid growth and at a time when it is a beginning to exercise more energetically.

Usually the first signs are that the young dog prefers to sit rather than stand, will often lie down when out on walks and has a characteristic bunny hopping back action with very little muscle development in the hindquarters.

Research has shown that the degree and development of HD is influenced by both genetic and environmental factors, with the heritability factor believed to be approximately 40% and the other 60% dependant on how the puppy is reared. To try to address the genetic component, the BVA established a radiographic screening programme in 1983 to assess the structure of a dog's hips. Since HD develops progressively between the age of 5-6 months and adulthood, the x-ray that is submitted to the BVA cannot be taken before the dog is 12 months. A panel of veterinary experts examines the x-ray plate grading many factors which make up the hip joint to a set of predefined criteria, and awards each hip a numerical score. This scoring scheme allows for each animal to be graded. The points range is from 0-53 on each hip making a maximum total of 106 – the higher the score the more dysplastic the hip.

In the early days of this scheme, English Setters were one of the breeds that were worst affected, but after many years of careful breeding the hip status of our breed has improved considerably. At present well over 3000 English Setter have been scored under the scheme and the mean score for the breed is around 16 - however the BVA is now advising that it is the median score that is a better indication of the true hip status of a breed. To understand the differences between mean and median scores see the BVA explanation below:

BVA fact sheet - Median versus Mean hip scores

The Mean

The word 'mean' is synonymous with 'average', and therefore the breed mean score (BMS) within a breed is the sum of all the scores of the dogs examined within a given time period divided by the number of dogs in that group. The BVA's advice has traditionally been to breed only from dogs with scores below the BMS, and latterly this was revised to 'well below the BMS'. However, due to a mathematical quirk, the mean (average) SCORE is not the same as the score of the average DOG! This is because the scoring system is such that good hips score low and bad hips score highly. The high scores of a few dogs with severe changes will increase the BMS disproportionately and give a false impression of the average hip status in the breed; it will appear to be worse than it in fact is.

Here is an example: Fourteen dogs from the same breed are hip scored and receive scores of 0, 1, 2, 3, 4, 4, 5, 5, 6, 6, 7, 8, 11 and 106. The total of these scores is 168 and the mean (average) score is 168 / 14 = 12. However, this score is higher than the scores of all but one of the dogs; it has been raised by the single dog with the very high score of 106. The thirteen dogs with scores of 0 to 11 appear to be better than average and only the dog with a score of 106 would be excluded from breeding.

The Median

The median is a figure in mathematics at which an equal number of items are both higher and lower. It therefore represents the middle of the population, or the average item. Because of the way in which the scores are given (higher scores = worse hips) the breed median will always be less than the breed mean over the same period of time.

Taking the dog example again, the median is the score at which there are an equal number of higher and lower scores. The median therefore represents the score of the 'average dog', the dog in the middle of the population with regards to its hips. The median score here is 5, as there are 6 dogs with lower scores (better hips) and 6 dogs with higher scores (worse hips). It therefore makes sense to breed only from dogs with hip scores below or at the <u>median</u> in order to improve or keep the current hip status. The dogs with scores of 6 to 11 are better than the breed mean score but are actually in the worse half of the breed and would not be recommended for breeding. **Using the median as the cut-off point rather than the mean therefore applies more appropriate and rigorous selection pressure.**

Latest BVA HD data can be found on this link -

http://www.thekennelclub.org.uk/media/455665/dog_health_report_2013_w eb

It is updated yearly and at present included in the KC annual Dog Health report - hopefully soon it will be incorporated into the KC's web health pages to make it easier to find.

Summary

It must be appreciated that selection of dogs for breeding based on hip scores is not an exact science, since environmental as well as genetic factors are involved in determining the nature of the hip joints. However, the best chance of producing offspring with good hips is to use only parents with low scores, considering the <u>median</u> as the ideal cut-off rather than the mean. The BVA's advice is now revised to make selection of breeding stock easier and medians as well as the means are published.

However, it must be recognized that hip dysplasia is not a black and white issue. It is not just the matter of whether a dog has or has not got the problem, but rather the extent to which it is affected as it is only very occasionally that an English Setter scores zero when screened.

All dogs and bitches should be x-rayed and scored using this BVA/KC scheme before they are bred from – it is a requirement for the Kennel Club Assured Breeder' scheme. This helps to ensure that only those animals with acceptable hips are used for breeding. Any mating which uses an animal below the breed average has the potential to improve the overall state of the breed with regard to hip dysplasia. Similarly, use of an animal with a score above the breed average should not necessarily be condemned providing the immediately preceding generations are of low-score and an effort has been made to use a low-scoring stud dog. It is not uncommon for parents with good hips to produce offspring with poor hips as there may be ancestors in the pedigree with poor hips and this can come to the fore in a subsequent generation. Occasionally, puppies produced from several generations of low-scoring ancestors can still be affected. It is important to remember that veterinary research indicates that there is also an environmental influence on the incidence of HD. Poor management of the growing dog will prevent it reaching its maximum potential in terms of hip status. Over-exercise, over-feeding,

excessive use of vitamins and supplements can all have an adverse effect on the development of bones and joints.

When planning to breed a litter, the hip status of the parents is one of many areas a breeder should consider, along with general confirmation, soundness, good temperament, etc., but a prospective buyer should always enquire about the hip status of the parents and ancestors and take this into account when considering a purchase – never buy a puppy if the parents have not been tested and always try to find a puppy whose parents have scores around or preferably below the breed average. Ask to see the official KC/BVA scoring sheet (example below) or check the parent's score on the Kennel Club website – go to Mate Select, breed Health Test Results finder tab:

http://www.thekennelclub.org.uk/services/public/mateselect/Default.aspx

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X-ray plate of a setter with good hips – note that the dog's microchip number is permanently marked on the x-ray for accurate identification and is also on the BVA score sheet (see above).



X-ray plate showing English Setter with poor hips:



This animal scored 29 on the right hip and 36 on the left – a total of 65, well above the breed average making it unsuitable for breeding.

Affected dogs should not be allowed to get over-weight and are best kept in warm dry conditions. Initially, exercise should be restricted to lead walks and if possible regular hydrotherapy sessions to develop the hindquarter muscle mass. This regime, along with veterinary-prescribed anti-inflammatory drugs will often succeed in stabilising the joints and allow the dog to lead a relatively normal pain=free life. There are several surgical options available from resectioning the pectineus muscle to relieve pressure on the joint to a full hip replacement.

Much more information on Hip Dysplasia and the BVA scheme can be found on the BVA website – www.bva.co.uk