Hip Dysplasia:

AVA/ANKC Hip Score Scheme

Hip dysplasia (HD) is a common inherited orthopaedic problem of dogs and a wide number of other mammals. Abnormal development of the structures that make up the hip joint leads to subsequent joint deformity. ‘Dysplasia’ means abnormal growth. The developmental changes appear first and because they are related to growth, they are termed primary changes. Subsequently these changes may lead to excessive wear and tear. The secondary changes may be referred to as osteoarthritis (OA), osteoarthrosis or degenerative joint disease (DJD). Later one or both hip joints may become mechanically defective. At this stage the joint(s) may be painful and cause lameness. In extreme cases the dog may find movement very difficult and may suffer considerably.

Structure and function

The normal hip is an ideal means of transferring power from the muscles to drive the body forwards with maximum strength and speed. It is the close relationship of the femoral head (ball) and acetabulum (socket) which enables rapid changes of direction. The entire hip joint is a unit comprising the bony structures contained within a joint capsule and supported by ligaments, tendons and muscles together with all their blood vessels and nerves. The large joint surfaces are lubricated by synovial fluid. The viscosity (oiliness) of this fluid ensures smooth pain free joint movement. It is not surprising that any variation from this ideal can have severe consequences.

Developmental demands

It is argued that dogs are not born with hip joints already affected by dysplasia (unlike humans) but that any faults in development will tend to escalate with time, particularly during the rapid growth phase from about 14 to 26 weeks of age. However, changes begin as the very young puppy starts to become active and continue until the puppy is skeletally mature. Wear and tear of the deformed joint results in varying amounts of inflammation and degeneration which lead to more deformity. This progressive deformation is sometimes referred to as remodelling.

Some dogs may treble their size and body weight in just three months of adolescence so it is not surprising that there are many critical factors for the puppy at this stage. All the essential nutritional requirements for skeletal growth must be available in the right proportions and at the right time. The environment within which the dog is raised, including the type and intensity of exercise, growth rate and body weight are significant influences. However, inheritance is a major factor and this is something which we are able to influence by the selection of breeding animals.

Radiograph of normal hips in a greyhound. The hip is a ‘ball-and-socket’ joint, the ball being the head of the thigh bone or femur, and the socket being part of the pelvis called the acetabulum. In good hips the femoral head is smoothly rounded and fits tightly and deeply into the acetabulum. The outlines of the bone are clear since there is no secondary osteoarthrosis. Compare this image with those of dysplastic joints below.
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Signs
As HD can include joint looseness (laxity), inflammation, pain, new bone formation and bone erosion, it may cause a range of observable signs from normal to minor changes in gait (in the mildly affected cases) to obvious lameness, stiffness after rest and exercise intolerance and pain. As some individuals and breeds may be more stoical than others there is no way of estimating the severity of HD in any dog by observation alone. A veterinary surgeon’s physical examination will provide a more reliable assessment by revealing limitation of joint movement, muscle wasting and pain in the joint(s). Usually a dog with HD does not demonstrate discomfort by yelping, as pain is likely to be dull and continuous rather than sharp and acute. The dog may, though, groan while resting or getting up. Radiography is the only means of determining the presence or absence of HD.

Radiographs
Radiographs (X-rays) are taken to look at the relative shape and positions of the femoral head and acetabulum and the presence and degree of any secondary changes.

Severe hip dysplasia: The right hip (R) has slipped out the socket (the acetabulum). This hip has dislocated because the socket is so shallow. The left hip (L) is just in the socket, but the socket is again very shallow and has been completely remodelled. There is more new bone around the left hip joint (osteoarthritis) than around the right. This is nature’s way of attempting to stabilise an unstable joint.

Causes
It is known that two factors determine whether HD will occur, and if so, how bad it will be. These are hereditary and ‘environmental’ factors. ‘Hereditary’ relates to the genetic code passed to the offspring by both parents and environmental are all the outside influences which alter and shape the growth and functions of the bones, cartilage, ligaments, tendons and muscles of the body. In simple terms the genetic code is rather like an architect’s plan (genotype), while the environment is like the builder and his materials (phenotype). In HD the architect has made some errors but the builders have a great influence on how things finally look and function.

Treatment
It is possible to alleviate some or most of the signs of pain and limitation of movement caused by HD. Sophisticated medications and various surgical procedures are now available. Applied heat, massage, good bedding, exercise and weight management as well as nutrition and physiotherapy also play a part in caring for a dog affected by HD. Professional advice is always necessary to ensure that the best strategy is developed.

Some common breeds at risk
+ Labrador Retriever
+ German Shepherd Dog
+ Golden Retriever
+ Rottweiler
+ Bernese Mountain Dog
+ Newfoundland

The AVA/ANKC Canine Hip and Elbow Dysplasia Scheme (CHEDS)
All radiographs submitted to the AVA/ANKC Hip Dysplasia Scheme are ‘scored’. The hip score is the sum of the points accrued for each of nine radiographic features in each hip joint. The lower the score the less the degree of HD present. The minimum (best) score for each hip is zero and the maximum (worst) is 53, giving a range for the total score of 0 to 106. Sires (fathers) to be bred from should ideally be ones whose progeny (offspring) have achieved consistently low scores.
scores. The same selection procedure should be used for bitches for breeding, since the use of animals with greater than ideal scores will increase the risk of producing offspring with higher scores. Failure to use the scoring system may give disappointing results but can also be potentially costly in terms of compromised breeding plans. It may lead to litigation, besides raising important animal welfare issues. For the hip scoring scheme to be meaningful and successful it is important that all potential breeding dogs are radiographed and that all radiographs taken under the scheme are submitted for scoring, whatever the apparent state of the hips. In addition, scoring of progeny, even if not intended for breeding, will provide much useful data for genetic analysis. This will ensure that the information gathered is as relevant as possible. For further information please visit: www.bva.co.uk/chs

Breed Specific Statistics

The breed mean score is calculated from all the scores recorded for a given breed (both high and low) and reflects the overall HD status for the dogs scored in that breed. The median is the middle score of the population, that is, 50 per cent have a lower score and 50 per cent have a higher score. At the time the radiograph and certificate are returned to the submitting veterinary surgeon, a copy of the breed specific statistics will be enclosed so that the veterinary surgeon may best advise his/her client regarding the dog’s suitability for breeding. All breeders wishing to control HD should breed only from dogs with hip scores well below the breed mean score and ideally below the median.

Getting a dog’s hips scored

Owners should contact their veterinary surgeon and arrange an appointment for their dog to be radiographed (X-rayed). The radiographs must be taken under anaesthesia which means that the dog may have to be left for a day stay at the veterinary practice. Hip radiographs can be taken at the same time as those for the Elbow Dysplasia Scheme.