

Definition of PennHIP Terms

Acetabulum - The "socket" component of the hip.

Canine Hip Dysplasia (CHD) - A developmental, degenerative condition affecting the ball and socket of the hip. Conventionally diagnosed radiographically by the presence of degenerative changes and/or subluxation of the hip. While the precise role of subluxation in the development of CHD has been poorly studied and remains controversial, radiographic evidence of osteoarthritis is undisputed confirmation of CHD.

Certified PennHIP Member - A veterinarian who has been trained in the PennHIP method and has successfully passed the quality assurance exercises demonstrating competence and repeatability in performing the PennHIP evaluation method.

Compression View - One of radiographic views taken during a PennHIP evaluation. During Compression, the femoral head is pushed fully into the acetabulum. This view is included for purposes of accurately indicating hip landmarks and to demonstrate joint congruity how well the femoral head "fits" into the acetabulum.

Degenerative Joint Disease (DJD) - A degenerative condition of the hip characterized by one or more of the following: cartilage damage, joint effusion, synovitis, periarticular osteophyte formation (bone spurs), subchondral bony sclerosis, and ultimately bony remodeling. DJD is synonymous with osteoarthritis and its radiographic presence in the hip is considered diagnostic of CHD.

Distraction Index (DI) - DI is a measurement of maximal passive hip laxity. It is a unitless number between 0 and 1. A smaller DI means less laxity (tighter hips) and less susceptibility for DJD. A DI of 0.50 is interpreted to mean that the femoral head is 50% displaced from the acetabulum. DI has been shown to correlate strongly with a dog's probability of developing hip DJD.

Distraction View - One of three radiographic views made during a PennHIP evaluation. Dogs are heavily sedated or under general anesthesia. A special "distraction device" is placed between the legs with the dog on its back. The device acts as a fulcrum to apply a harmless lateral distractive force to the hips. The legs are positioned to optimize the measurement of passive laxity. The amount of hip laxity is quantified using the distraction index (see above).

Functional Hip Laxity - Hip laxity, or hip excursion, that occurs during weight-bearing activity such as walking, running or jumping. Functional hip laxity is associated with the development of high joint stresses that cause cartilage damage and ultimately DJD. While it would be very useful to know the onset and magnitude of functional hip laxity, it is a dynamic condition that is not possible to measure.

Heritability - Heritability indicates the proportion of phenotypic variation that is due to additive genetic effects. It expresses the extent to which phenotypes (for example, CHD) are determined by the genes transmitted from the parents. Heritability is not a biological constant and will likely vary by breed. Higher heritability means faster genetic change through selective breeding. The DI phenotype is highly heritable (0.61 for German Shepherd Dogs) and indicates that DI is a promising criterion on which to base the selection of breeding stock.

Hip-Extended Position - One of the three radiographic views made during a PennHIP evaluation. The hip extended position is included for purposes of evaluating the hips for existing degenerative joint disease. It is not a reliable position for showing true passive laxity because it masks laxity by 60% to 90%.

Hip Laxity Profile - Hip laxity profile refers to the "current" distribution of passive hip laxity (DI) within a breed. It allows the breed or the individual dog to be compared to other breeds or other individuals within the same breed. Combining this information with radiographic evidence of DJD within a breed facilitates a breed-specific determination of CHD susceptibility. In addition, regular monitoring of changes in hip laxity profiles over time permits an assessment of progress of selective breeding attributable to the PennHIP procedure.

Osteoarthritis - See Degenerative Joint Disease (DJD).

Passive Hip Laxity - Passive hip laxity refers to the hip laxity that is measured in a dog that is sedated and non weight-bearing. Since it is not possible to measure "functional hip laxity," all hip evaluation methods assess (subjectively or objectively) the magnitude of passive hip laxity.

PennHIP - PennHIP stands for AIS Pennsylvania Hip Improvement Program. PennHIP encompasses the overall evaluation method, the Network of veterinary providers, analytical and support staff, as well as an extensive database of hip and breed evaluation data.
