

Hip Dysplasia:

PennHIP Hip Score Scheme

Canine Hip Dysplasia

- + Is the most commonly inherited orthopaedic disease
- + Leads to hip arthritis causing pain, stiffness, and diminished quality of life
- + Has no medical or surgical cure
- + Afflicts more than 50% of the dogs within some breeds
- + Clinically affects large breed dogs more severely than smaller breed dogs

Hip Laxity

- + Hip laxity is the key factor in the development of hip dysplasia
- + The hip joint is a ball-and-socket joint, with the ball of the femur (femoral head) fitting into the hip socket (acetabulum)
- + Hip laxity refers to the degree of "looseness" of the ball in the hip socket
- + Studies have shown that dogs with looser hips (excessive hip laxity, eg German Shepherds) are at higher risk to develop dysplasia than dogs with tighter hips (minimal hip laxity, eg greyhounds)

University of Pennsylvania Hip Improvement Program (PennHIP)

- + The research-based hip-screening procedure known as PennHIP has proven to be the most accurate and precise method to measure hip laxity
- + It can identify hip laxity as early as 16 weeks of age + This offers breeders the opportunity to make early decisions on breeding stock
- + Allows veterinarians to advise pet owners on lifestyle adjustments and preventative strategies to minimize the pain and progression of the disease

The PennHIP Procedure

- + Veterinarians must complete specialised training and quality-control exercises before becoming certified to perform the PennHIP procedure
- + The dog is anaesthetised to relax the muscles
- + The dog is positioned on the x-ray table with hips in a neutral orientation, and an x-ray is taken
- + The hips are placed in a position where they are the tightest they can be, which gives a baseline reading
- + A custom distraction device is applied to reveal the maximum amount of hip laxity
- + A complete PennHIP evaluation includes office consultation, sedation/anaesthesia, and submission of the three PennHIP radiographs to the University of Pennsylvania for evaluation
- + Your certified PennHIP veterinarian will be happy to discuss the procedure and cost with you

PennHIP Radiographs

- + PennHIP screening includes three separate radiographs (X-rays). Below are examples of the three PennHIP radiographs of a 15-month-old Labrador Retriever
- + This exclusive feature of the PennHIP procedure permits accurate measurement of maximal hip laxity
- + This view can identify critical anatomic landmarks of the hip and determine how well the femoral head fits into the acetabulum

Distraction Radiograph

The dog's hind legs are positioned in a neutral, weight bearing orientation and a special device is used to reveal the dog's inherent joint laxity.

Compression Radiograph

The dog's hind legs are positioned in the same neutral position as the distraction radiograph but the femoral heads (balls of the femur) are gently seated into the acetabula (hip sockets).

Hip Dysplasia:

PennHIP Hip Score Scheme

Hip-Extended Radiograph

- + Traditional hip screening methods rely solely on the hip extended view to evaluate both the presence of hip arthritis and joint laxity (subluxation)
- + Using traditional systems, a large number of dog's hips would be considered normal because the hip-extended view shows no evidence of arthritis or subluxation (laxity)
- + While the hip-extended view can detect existing arthritic changes, it often conceals hip laxity thereby giving a false impression of joint tightness
- + In the absence of arthritic changes, the hip-extended view does not reliably distinguish between dogs that are disease-susceptible and those that are not
- + When comparing the hip-extended view to the distraction view, the distraction view reveals much greater joint laxity
- + The PennHIP method uses the amount of joint laxity revealed in the distraction view to indicate a dog's susceptibility to developing hip dysplasia
- + Dog's with hip laxity will likely show radiographic evidence of hip arthritis later in life

Hip Scoring and Report Interpretation

Your PennHIP veterinarian will submit the three PennHIP radiographs to the University of Pennsylvania for specialized evaluation. A confidential report comprised of the following three key parts will be sent to you and your PennHIP veterinarian:

a) Distraction Index (DI)

- + The DI is a measure of hip laxity—the inherent distance the ball can be displaced (distracted) from the hip socket—and is expressed as a number between zero and one
- + A DI near zero indicates little joint laxity (very tight hips)
- + A DI closer to 1.0 indicates a high degree of laxity (very loose hips)

- + Dogs with tighter hips are less likely to develop hip dysplasia than dogs with looser hips
 - + A threshold level of 0.30 has been identified, below which hip dysplasia is very unlikely to occur.
- ### b) Arthritis
- + The PennHIP report also includes an evaluation of the hip-extended radiograph for evidence of arthritis, confirming a diagnosis of hip dysplasia
 - + For dogs with evidence of arthritis, your PennHIP veterinarian can explain the disease fully and recommend palliative measures
- ### c) Breed Laxity Profile Ranking
- + Based on the DI, your dog is ranked within its breed
 - + For the dog breeder this ranking helps in the selection of breeding candidates—dogs in the tighter half of the population are recommended for breeding
 - + By selecting breeding dogs with tight hips (lower DI), meaningful progress toward better hips can be made within a few generations

PennHIP - Making a Difference

- + PennHIP is the most accurate hip screening method available and can be safely performed on dogs as young as 16 weeks of age
- + An early estimate of a dog's hip integrity is invaluable, whether the dog's intended purpose is for breeding, for working, or as a family pet

For Breeders

- + Information compiled in PennHIP's international database permits informed selection of breeding stock based on hip tightness relative to other members of the same breed
- + Breeders can reduce the incidence and severity of hip dysplasia in future generations of dogs by applying selection pressure towards tighter hips
- + Among current hip screening methods, PennHIP has the highest heritability value to bring about these genetic changes



Hip Dysplasia:

PennHIP Hip Score Scheme

For Service and Working Dog Organizations

- + Service and working dog organizations were the first to adopt PennHIP as the principal method for hip screening
- + The investment in training service/working dogs is enormous
- + The ability to pre-screen the dog's genetic predisposition to hip dysplasia is an invaluable tool when evaluating a future service/working dog's hip integrity

For Companion Dog Owners

- + If your dog is identified to be at risk for hip dysplasia, your PennHIP veterinarian can recommend, at an early age, appropriate strategies (diet, medication, and/or activities) to delay or diminish the ultimate course of the disease
- + The PennHIP database has expanded rapidly, representing all major breeds. Interest in utilising the PennHIP method as the primary hip screening tool continues to grow both nationally and internationally
- + PennHIP is recognized by the American Kennel Club for inclusion in its Canine Health Information Centre (CHIC)
- + For more detailed information, or to find a certified PennHIP veterinarian in your area, visit the PennHIP website at www.pennhip.org