

Canine Hip Dysplasia Update on Hip Registries, 2001-2002

by Fred Lanting
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Fred Lanting is a German Shepherd fancier and breeder. He has spent much of his life studying canine hip dysplasia. In 1972, he published the only book on the subject, Canine Hip Dysplasia. This article is an update on ways of registering and certifying dogs so that the public can determine if the dog they are breeding to or the dogs they want to buy a puppy from are clear of the disease.

This article is slightly more than an update on the hip registries operating in the U.S. (and Canada, to a great extent). I hope to not only bring you the current status of each of the three as we turn the corner into 2002, but also stress again the importance of an open registry to progress in reducing incidence of HD in segments of breeds (sometimes called strains, but more accurately breeding lines). I have been working in the field of canine orthopedic disorders since 1966, and am convinced that the best course a breeder can take is multi-faceted:

1. Select the very best dogs (companion, working dog, or foundation stock) you can find.
2. Use the most accurate and advanced diagnostic techniques available and economically feasible.
3. Base breeding decisions partly on progeny results; one tool in that category is BV or ZW (Breeding Value or Zuchtwert).
4. Favor open registries; these are those in which the “failures” as well as the dogs with better hips are identified publicly.

We might as well consider these items in the order summarized above. Whether you intend to breed dogs or not, number 1 is very important. You and/or your puppy customers certainly would not purposely select defective dogs, but in effect, *not* selecting *against* a problem can be thought of as selecting *for* it. Think of the analogy in training. If you do not train for correct behavior, you are actually “training” incorrect behavior. Picking a dog to share your life, home, and time could be a ten-year or longer investment. Besides the features of temperament, size, coat, general health, and so many more, you owe it to yourself and the dog to choose an animal that has good odds of having serviceable hips and other joints. Back in dogdom’s dark ages, longevity of ancestors, ability of parents and the individual to work long hours without pain or perform certain utilitarian functions were all that owners could use. In the 1950s and `60s, realization that hip dysplasia could often be detected with radiography, and that it was an identifiable genetic disorder, led to the establishment of many hip detection and registration schemes around the world. In the U.S. (and serving much of Canada’s needs), the Orthopedic Foundation for Animals was established at the U. of PA, with Wayne Riser at the helm. Breeders now had a standardized means of listing potentially valuable breeding animals that had no evidence of severe or moderate hip dysplasia. This was a definite advance over the performance tests, giving more information on this specific portion of a dog’s phenotype. Dogs that were considered “normal for age and breed” were given a certification number, and as time went on, people could fairly safely assume that a dog without this certification were dysplastic. The certificate thus became a valuable commodity. It marked dogs as more valuable than similar dogs without it. Unfortunately, the inertia that came with great numbers of dogs in the OFA registry may have contributed toward an unwillingness to consider technological improvements.

After 30-some years of service to breeders, this stagnation and protection of the old method had left breeders on a plateau without offering any ladder to the next level of progress. It was time to examine new paradigms.

That much-needed route to the next pinnacle also came out of the U. of PA (called “Penn”). By the early 1990s, research had already established an improved diagnostic or predictive technique that promises great benefits to those who want to produce or buy sounder dogs. As Solomon said, there is nothing truly new under the sun, but there can be advances and better combinations or arrangements of data or genes or methods than what has been seen before. The better method, given the acronym PennHIP[®] for (University of) Pennsylvania Hip Improvement Program, was not entirely new, but was based on the concept suggested by earlier experiments in puppy palpation, “wedge” radiography, and other positions utilizing stress to push femurs apart and demonstrate joint laxity that was hidden in the older views. It is a more highly refined approach, standardized for accuracy and repeatability, and is more quantitative than the almost entirely subjective OFA or hip-extended approaches. While the older position with the dog’s legs stretched out as if resembling those of a bipedal human lying supine on the table is best for identifying mineralization (“calcium deposits” and arthritis) in the hip joint, it allows too much covert laxity to be a reliable indicator of things to come. Since in many or perhaps most cases a loose hip will develop degenerative joint disease (DJD), it is wise to detect as much laxity as possible and compare it with numerical, measurable standards of excellence and risk. The looser the joint, the higher that risk of the dog’s eventually getting DJD, regardless of breed. Website articles that treat the differences between PennHIP and older methods in more detail include those on <http://realgsd.net/GSDinfo/News/FredL/1fredlanting.htm>, www.synbiotics.com, and www.vet.upenn.edu/researchcenters/pennhip/. One of the important advantages of the PennHIP stress-radiography method is that it allows accurate and much earlier prediction of an individual dog’s later hip status; it is a vastly improved estimate of risk for developing DJD. And the scientific data is more than sufficient to be a convincing case for breeders to use PennHIP. As I have said in another place, those who quote old information and say that “School is still out on the PennHIP method” simply have been skipping classes in the past several years.

The use of Breed Value (progeny and sibling results being made part of a dog’s likely genetic picture) has not been practiced much in this country. It is an old, established, and critical feature of dairy cattle breeding, but in the U.S., only two groups are known to utilize its very helpful advantages. One is the breeding program at The Seeing Eye, Inc.[®], the famous school for guide dogs for the blind in Morristown NJ. The geneticist there, Dr. Eldin Leighton, has used PennHIP for diagnosis/prediction and BV data on relatives (mostly siblings, ancestors, and progeny) to make great strides in reducing HD incidence far below that possible in any other breeding program. The other is the community of fanciers devoted to the imported German Shepherd Dog. In Germany, the SV (parent breed club for all GSDs worldwide) has adopted a very similar data analysis system called *Zuchtwert* (breed worthiness). Through a very complicated formula, the numbers and values of acceptable and unacceptable hip ratings of siblings and progeny are calculated. Stud dogs and brood bitches with low ZW numbers are more desirable as breeding partners and the parents of a pup you’d want to buy. The average hip quality of GSD in Germany is *fast-normal*, meaning “nearly normal”, and the ZW number of 95 correlates to that status in a statistical way. That is to say, a dog with 95 might not have fast-normal hips itself, but on average, there is a correlation across the breed population. A dog whose hip radiographs are

superior will get a lower ZW number than he was born with, which was the average of his parents' numbers. Furthermore, if he has previous siblings and half-sibs that have been radiographed, their results can also move his number one way or the other. His sire or dam may produce better or worse hips with a different parent, and that will also affect his official number. For the non-statistician, it is enough to look for families and individuals with low numbers, as the higher the number, the more HD that particular dog has produced or is likely to produce.

The fourth major tool in a successful fight against proliferation or prevalence of hip dysplasia, or almost any disease for that matter, is knowledge. This time, knowledge in the form of open and honest information on the hip status of the dog you are interested in breeding to or getting a pup out of. On this side of the oceans, we have only one truly open hip registry, the GDC, which stands for Institute for Genetic Disease. This organization is on shaky ground because breeders are not availing themselves of the benefits that would apply if they practiced more participation, more sharing of information. Without sufficient numbers of dogs in the database, the GDC can do very little to give what could be a better look into the genotypes of the potential breeding animals. If people change sufficiently, the GDC can revive; at present, it may have to act in a more limited manner. One obstacle is the complacency of the American dog fancier. The typical owner took a long time to accept OFA or an equivalent registry of "normal" or "acceptable for breeding" dogs. To change horses in mid-stream is not something most would want to attempt, or have the gumption to do even though it is easy. The other obstacle is the OFA's intransigence to such matters of progress. They had the opportunity to persuade their almost-captive clientele to switch to an open registry, one in which inquirers could get the readings on potential studs, dams, or near-relatives of their own potential breeding stock, but the managers gave the inadequate excuse that it might discourage owners from having dogs radiographed and entered into the database. They have refused to adopt the progressive ideas of GDC as they have refused to advance into the superior stress-radiographic technique developed at Penn. It is largely a matter of politics. OFA leaders are at personal odds with those at Penn, and resented the possible threat of competition from GDC. If cooperation were the word of the day instead, there would not have been the need for competing organizations. But the person carrying old, heavy baggage is going to be passed up by others sprinting for the best seats on the train. As we "go to press" with this article, GDC is engaging in more friendly discussions with OFA. GDC is to be found at <<http://www.vetmed.ucdavis.edu/gdc>>.

I contend that the wisest breeders and shoppers will use all the tools they can to improve their breeds and lines. The ultimate would be to use PennHIP for early risk prediction and a numerical comparison value, selection of stock with lower ZW-BV numbers if available, and submission of radiographs to an open registry (GDC if they still operate that service for hips). Breed clubs can do much to improve genetic health by peer pressure through awards and codes of ethics. Unfortunately, they are not allowed to put restrictions on which dogs are allowed to breed if they are affiliated with AKC, as that monolith is in the business of appropriating not only breeds and breed clubs, but controlling all registration decisions as well. And their practice has always been to register anything as long as the money and the form are sent in, and there is no complaint about it. In other countries, it is the breed club that is the sole and responsible guardian of the breed. Here, we must rely on salesmanship and P.R. to mold attitudes and encourage compliance with common-sense practices such as those that would improve hip quality.

What about the update on progress mentioned at the outset? The GDC is floundering, though worthy of support and revival. The OFA shows no signs of progress. Nor do they supply us with print information, but direct us to their inadequate but large website. It does little good, when the hip-extended method is ambivalent in value or accuracy, to list only dogs that have “passed” their low or imprecise standards — what of the other relatives that do *not* pass? What of progress at Penn? This is the only one of the three that is moving at “fast-forward”, and much has been published in the professional (veterinary) literature that supports the value of the PennHIP technique. Among the latest are two articles that should appear around the first quarter of 2002 in JAVMA, the largest and possibly most prestigious and demanding of the vet journals. One is on risk factors for DJD and its confirmed relationship to DI. Distraction Index is Penn’s numerical (quantitative) description of how much laxity can be revealed when a small but significant force is applied to separate the ball from the socket so that a picture can be taken while the hip is in this loosest state. Remember, OFA’s premise is also that “tighter is better”, although Penn has the only well-known method of determining true tightness. Another article will deal with the significance of a line of extra density, thickening, or mineral deposits on the shoulder of the femur, first studied by Dr. Joe Morgan at U-Cal.-Davis and popularly known as “Morgan’s line”, but in the new paper referred to as “caudolateral curvilinear osteophyte”. I predict this mouthful will not replace the common moniker. Whatever it’s called, it may be a help to vets who still rely only on the hip-extended, subjective view.

Not really new, but an update of sorts for newcomers to the discussions on hip quality analysis, is the fact that PennHIP radiographs can only be submitted by trained and certified vets and their certified/trained technicians. Trained by Synbiotics/Penn, that is, in such symposia-connected sessions as the Feb. 10, 2002 Las Vegas seminar held immediately prior to the Western Veterinary Conference. Vets who withhold radiographs because, for example, there is obvious HD or DJD, are dropped from participation. This protects the integrity of the database and prevents the type of bias found in OFA, where mostly the good hip pictures are sent in, and the bad-hip dogs hide in the shadows. Vets who would allow their non-certified assistants to do the radiography without their personal action in holding the distractor or manipulating the dog’s legs will also face expulsion, as has happened twice that I know of. Semi-annual breed prevalence and statistical profile updates are made available to participating veterinarians and the Synbiotics or Penn websites. Penn has made a small move in the direction of an open registry, leaving the decision up to the breeder/owner to decide whether to check off the box indicating willingness to share information. That is a small box, and since an office worker often fills out the form down to just before the owner’s signature, it is not checked as often as it should be. Make sure you see and check-mark it when you have your dog evaluated by a PennHIP practitioner, so others interested in breeding to your dog or its parents can contact you. If you want to find out about the DI of a dog or close relatives, you can network with the owners who allow their names and addresses to be made available. PennHIP is still a closed registry, so they will not reveal the DI of dogs, but they advise that when you contact the owner-participants, you ask for a photocopy of the official PennHIP report. If not, you could be fooled by disreputable owners. For example, a dog with considerable DJD may have its joints so “frozen” by calcium deposits that much laxity cannot be demonstrated. You also must see the part of the report that mentions the absence or presence of remodeling or DJD or evidence of HD. Just to say that a dog is in the 80th percentile or whatever, in regard to comparative laxity is not enough. You need all the information on the report. An owner can get his breed’s listing by phoning Synbiotics at 800-

228-4305, and using the phone prompt for “Technical Services”, then asking for “Breeders wishing to share information”.

What is the latest in certain breeds? I am listing here only those breeds for whose magazines or websites I have previously written articles. The others will be found on Synbiotics’ website. I’ll start with my own favorite breed, the GSD, although the Golden has one-third more dogs in the database and the Lab has nearly 80% more. The GSD has a mean DI of 0.43 which means that you should prefer breeding partners that are not higher, and especially look for ones toward the 0.3 threshold below which there is no DJD development. The Shiloh Shepherd, basically a strain of GSD selected for larger size among other characteristics, also has a mean of 0.43 but the King Shepherd, a small splinter or dissident group from the Shiloh club’s original registry, has 0.5 as their mean DI. This could mean that the breeders and owners of King Shepherds are more lax than their dog’s hips! For those not familiar with DI, let me suggest that you could think of a number such as 0.50 as representing a joint in which distraction allows the ball to be moved about 50% out of the socket. For a Corgi, Neapolitan Mastiff, or Newfie, this amount may not be as serious, but for a GSD it is definitely a situation to be avoided. There *are* breed differences as to relationship between laxity (DI) and later DJD.

Airedale Terriers: 0.58, but this is one of those breeds in which the DJD isn’t as bad at that level as it would be, on average, in the GSD.

American Bulldog: 0.57

American Pit Bull Terrier and American Staffordshire Terrier (basically the same breed with different registries): 0.59 to 0.61

Australian Shepherd: 0.49

Australian Cattle Dog: 0.56

Canaan Dog: 0.48, which may surprise some who believe that the rigors of feral life eliminate much HD; in fact, more depends on a combination of breed/group/family phenotype in those “wild” breeds that actually do not compete that much for food and breeding. But the truly wild dogs that rely on very demanding environments that weed out the weak, and allow only the strongest to do the breeding in the pack, are famously low in HD incidence. The wolf in its many varieties, the Dingo, and even such wolf-domestic dog blends are examples. The Lupine breed, which is mostly Northern Gray Wolf or Timberwolf, and the American Tundra Dog which is another wolf blend, do not have statistically high enough numbers submitted to PennHIP yet, but so far are quite low in DI and I predict will continue to be so.

Dutch Shepherd: 0.53 It is interesting to compare this with its close cousins the Belgian Shepherd varieties — the black Groenendal has 0.3, the mahogany Tervueren has 0.35, and the short-coated Malinois has 0.39. The Dutch Shepherd is phenotypically and probably historically an intermediate form between the GSD and the Belgian Shepherds.

Mastiff: 0.51 More commonly, perhaps, referred to as English Mastiff or Old English Mastiff

English Shepherd: 0.62 Also known by some as “Farm Shepherd”, a breed found mostly in the U.S.

Fila Brasileiro: 0.56

Greater Swiss Mountain Dog: 0.56

Neapolitan Mastiff: 0.65

Nova Scotia Duck Tolling Retriever: 0.53

Rottweiler: 0.55 It is of importance and interest that the typical Rottie with a given DI will usually have less DJD than a typical GSD with the same DI. There are even greater differences between several other breeds.

Shiba: 0.52 Compare this with its descendant, the Akita which has 0.6, but also with breeds more frequently identified with HD symptoms. Even light-weight, small dogs' hips should be monitored and improved.

By the way, the Greyhound is listed as having a mean DI of 0.23, but it was not made clear if this included both the track and the show Greyhounds. Breeds like this and the Whippet have nearly a zero incidence of HD, although occasional examples of dysplastic individuals are seen.

In summary, big advances in the field of hip dysplasia do not come along frequently, but when they do, there is no excuse for not availing ourselves of them. The latest "great new thing" was the introduction of the measurable stress radiography technique at Penn. Since then, voluminous studies there and elsewhere have confirmed the superiority of this radiographic approach over all others in the world. I am not including such overpriced research methods as MRI, nor do I foresee any genome maps in the future that will help, partly because of the polygenic nature of HD. Those who can use the most tools will have the best chance of success. If you have friends in countries where there are no PennHIP certified vets, urge them to use the ZW system where they can, and radiograph dogs later in life to see if DJD has developed after the usual age of certification, which frequently happens. If you don't have BV-ZW available in your breed, use PennHIP even if you have to travel. Share all your results with the public, whether flattering or dismal or anywhere in between, for the sake of the breed and your fellow dog fanciers.

[note: Fred Lanting, aka <Mr.GSD@Juno.com>, presents seminars worldwide on orthopedic disorders, gait-&-Structure, and other topics. He is an SV judge of the GSD, and an international all-breed judge for several registries. His co-owned website, managed by another, is <vonsalix.faiithweb.com>]