Info shared by Pitbull SA.

Manjaro APBT kennel.

South Africa.

My Website www.pitbullsa.co.za

My E mail "manjaro@pitbullsa.co.za"

My Facebook "Gawie Manjaro"

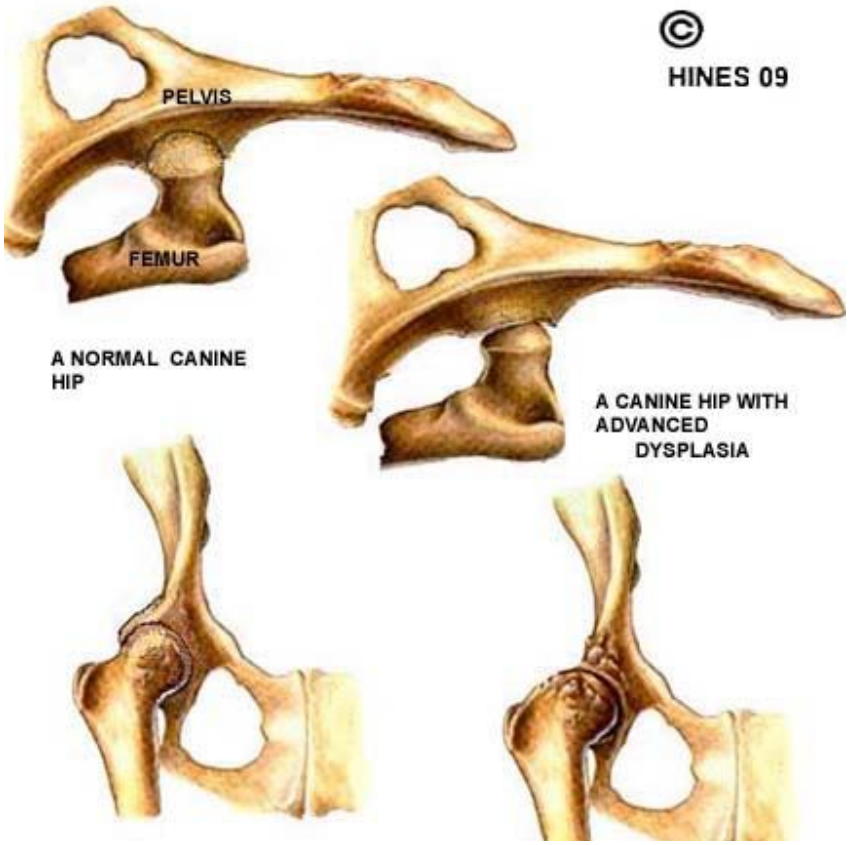
My Facebook page "Manjaro Kennel"

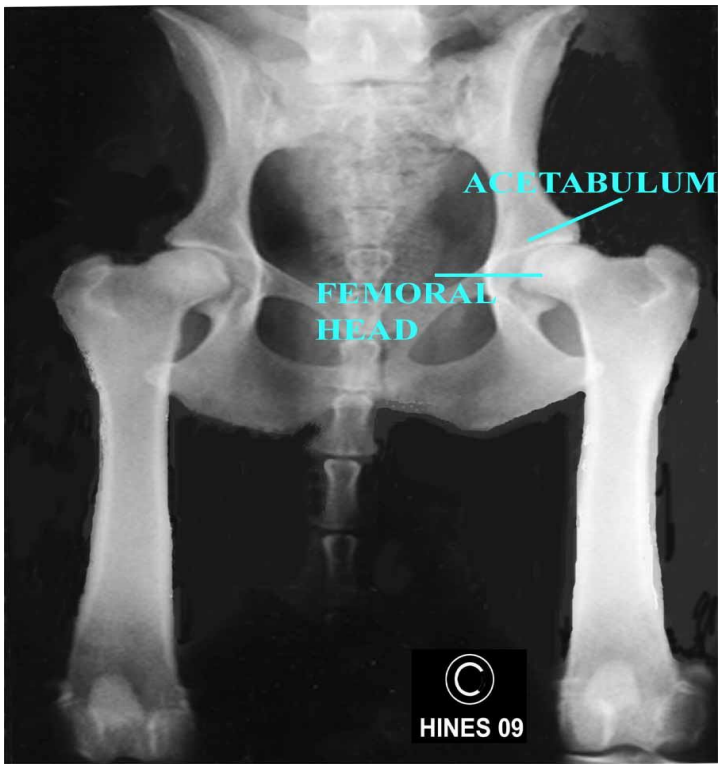
My mobile +27827838280.

Zello.com "VoIP" – ask for info.

1. Hip dysplasia.

Ron Hines DVM PhD





What is hip dysplasia?

Canine Hip Dysplasia (CHD) is an inherited problem – could also be caused by wrong excursive and over taxing the hip joint - that is due to abnormal looseness between the ball (femoral head) and socket (acetabulum) that form your pet's hip.

When these two structures unnaturally wear and therefore do not fit snugly anymore, they become loose and damage the joint, eventually deforming the bone and causing arthritis and pain.

All breeds of dog can develop dysplasia, but it is the larger breeds that are most likely to suffer, simply because they weigh more (then this have nothing to do with inherited –problems).

Sometimes the problem can be rooted in genetics, it tends to occur when one or both of the parents of the dog was also dysplastic.

But because more than one gene location and interaction is involved (polygenetic), it can skip generations or affect some puppies in a litter while sparing others.

That is what makes the problem difficult for breeders to stamp out.

Your dog's hip joint is constructed very much like the ball joint of your automobile.

The bone of the thigh (femur) has a ball that fits into a socket (acetabulum) formed by the pelvis.
This type of arrangement forms a very strong joint that allows a great range of motion and weight-bearing.

But for it to work properly, the ball must be held deep and snuggly within the socket, as it does in the views to the left of the picture you see above.
There are a series of very strong ligaments and cartilaginous layers that are supposed to do that.

When they don't, your pet is dysplastic.
When these ligaments and cartilage, holding the joint together, are too relaxed,
the joint does not function smoothly.
Instead, both the ball and the socket become irritated due to the grinding and rattling that occur as your pet walks or are exercised.
In response to this irritation, the bone dissolves and recedes in the areas of increased pressure and proliferates in the areas surrounding the pressure and irritation.
This is what has occurred in the two drawings to the right of the picture above.
This process is called osteoarthritis or degenerative joint disease.
The ball of the femur is called the femoral head and the socket of the pelvis into which it fits is called the acetabulum.
These two structures form the joint in which the ball rotates firmly within the socket, held together by these elastic ligaments.
Together with layers of flexible fibrous tissue and cartilage, they are called the joint capsule.
To further strengthen the joint, a round ligament runs from the centre of the ball to the centre of the acetabulum.
In a normal dog, the bones are shaped to perfectly match each other.
In dysplasia the fit is loose and no longer perfect.
There are all degrees of hip dysplasia, ranging from very slight changes, which cause no lameness or limp, to severe cases in which the entire architecture of the joint is lost to arthritis.

In these cases the round ligament and ligaments of the joint capsule are stretched, allowing the ball to wobble (subluxation) or slip entirely out of the acetabulum (luxation).
Although hip dysplasia almost always affects both legs, whichever side is the worst shows the lameness or limping.
The areas within the joint that touch are coated with a slick cartilaginous coating called the articular hyaline cartilage surfaces.
In a normal joint, they are very smooth and cushioned with layers of fibrous cartilage.
In a normal dog, all of these factors work together for smooth and stable joint function. In a dysplastic joint, these particular layers are eroded off, allowing bone-to-bone contact.
When bone rubs on bone, the bone under pressure dissolves while new bone is formed adjacent to it.
This is a vicious cycle.
As the new bone forms it also rubs on the opposing joint surface.
It is quite painful.
The femoral head that once looked as round and smooth as a billiard ball now becomes flattened, mushroomed and cauliflower-like.
The socket or acetabulum loses its depth and becomes shallow as the bone remodels.
The areas of bone adjacent to the joint grow new knobs and spicules of bone giving it a characteristic distorted appearance.

What breeds normally get hip dysplasia?
Clinically important hip dysplasia is particularly common in breeds that weigh over 30 kg.
It is more of a problem in stocky breeds such as German Shepherds and Golden Retrievers.
We see it more in purebred dogs than mutts.
But a cross between two dysplastic parents of different breeds is just as susceptible as a purebred.
Dogs that are on the high end of the accepted breed weight seem predisposed to the problem.

The OFA has ranked many large breeds with this problems, in order of frequency with which they suffer from hip dysplasia.
Among them, in order of frequency are Otterhounds (54%), Neapolitan Mastiffs (48%), St . Bernards (47%), Bloodhounds (26%), Newfoundlands (25%), Catahoula Hounds (25%), Chesapeake Bay Retrievers (21%), Rottweilers (20%), Golden Retrievers (20%), Norwegian Elkhounds (20%), Mastiffs (20%), Chows (19%), German Shepherds (19%), and Old English Sheepdogs (19%).
Hip dysplasia is common in many smaller breeds too.
Pugs, Bulldogs and Basset Hounds often have bad hips.
But they seem to get along quite well until they are quite advanced in years.

What signs will I see if my dog has hip dysplasia?
The two main factors that determine if and when you might see problems are the extent of the malformation of your dog's hips and its age.
But the rate at which your dog puts on weight as it reaches its adult size appears to also be a factor.
An overweight dog may also be more at risk or develop the problem sooner.

In puppies and younger dogs:
If your dog's joint malformation (dysplasia) is major, you can see signs of pain and discomfort as early as 5-10 months of age.
These pups take short, hopping steps - a lot like a rabbit.
When they rest after playing, they hesitate to get back up.
Instead they will sit on their haunches with their legs splayed outward like a frog.
They have trouble climbing stairs and going up slopes.
They are reluctant to jump up on things.
Because of the pain, these puppies often carry their rear legs far forward in order to keep more of their weight on their front legs.
When you examine these dogs, their upper thighs and hips are bony and lack muscle mass.
They are often cow-hocked, standing with their hocks almost touching.

Pups with severe dysplasia stand with their rear legs slightly forward so that their front legs can support more of their weight.

Puppies as young as 10-12 weeks of age can be examined for susceptibility to future hip dysplasia; either through a moderately accurate procedure called the Ortolani test (stretching the hip to feel if there is play .. a pop) that your local veterinarian performs during a general pet heath certification before the pup is sold.
RTealize the hip joints of a 6 – 8 week old pup is not fully developed and at this age still loses).
For the much more accurate PennHip evaluation (see links below) only done at 12 months as a preliminary evaluation and the final evaluation PennHip performed at 24 months of age when the dog is fully grown and developed as adult dog.

In adult and older dogs:
Only very severely affected pets develop pain and limited mobility prior to maturity – this detectable only at around 24 months.
Many more pets start showing signs of discomfort or pain **as fully-grown adults (that the purpose of why the PenHip test then can detect hip problems).**
Many dogs with mild to moderate hip dysplasia do not limp until they are 4 or 5 years old.
The pain is usually worst after exercise or first thing in the morning.
Morning stiffness usually works out as the day progresses.
Some dogs are very stoic and show little sign of lameness until arthritis in the hip is well advanced.
These dogs would rather sit than stand.
They have trouble rising and can't keep up with you on walks like the used to.
They spend more and more time lying on their side grooming themselves.
Their problem is worse in cold weather and when the dog has been lying on cement or tile floors.

X-rays can be misleading in these dogs in that the degree of joint destruction may not correlate with the degree of pain and lameness. Since more than genetics are involved, some dogs will not show evidence of dysplasia until they are past breeding age.
This is why all dogs should have their hips x-rayed prior to breeding.
The pain associated with this condition is due to the grinding of bone on bone within the joint and adjacent arthritic bone spurs.

The degree of discomfort varies from day to day early in the disease but becomes continuous as the condition progresses.

What Happens To My Pet's Hip When It Develops Hip Dysplasia?

All hip dysplasia that affects both hips, results from abnormal hip development when your pet was a puppy.
Although both hips are affected, one is usually a bit worse than the other.
Occasionally dysplasia will develop in one hip **due to a traumatic injury or dislocation.**

Because the hips are loose and unstable, the slick surfaces that coat them become inflamed and set in motion a very destructive process:
1) The two inflamed surfaces of the joint become rough and eroded.
2) The amount of fluid in the joint increases
3) Normal bone is lost and bone forms where it should not be
4) The normal shape of the ball and socket are lost
5) Painful bone spurs develop
6) The cartilage holding the joint together becomes looser and looser until the joint is dislocated (subluxated).

Altogether, the process is called degenerative joint disease or osteoarthritis.

How Will My Veterinarian Decide If My Pet Has Hip Dysplasia?

The signs you describe and your veterinarian's examination will make him/her suspect **a hip issue** in your pet.

The vet will probably stretch your pet's rear legs backward and rotate them to see if this causes pain.
The veterinarian may ask to see you walk the dog around the office and feel for a "pop" in the hip joint by performing a manoeuvre called the "Ortolani sign"
But to find out for sure, your veterinarian will want to x-ray your dog. Two x-rays are usually sufficient.

Because dogs are fearful and tense when they are x-rayed, the pet is usually sedated for this procedure.
The x-ray image at the top of this article is one of the standard views with the dog positioned on its back.
In the other view, the dog will be laying on its side.
While the dog is relaxed and sedated, manipulation of its hips might or might not show abnormal looseness, or lack of smooth motion.

Can My Dog Be Guaranteed To Be Hip Dysplasia Free?

A hip x-ray will tell your veterinarian if your dog **currently has problem hips.**
Know this! - The closer your pet is to attaining two years of age, the more likely it is that it will remain free of premature joint disease – that's why the only real test is the PenHip test at 24 months of age.
Also know this! - Remember that arthritis - including hip arthritis – (**this is not hip dysplasia**) is a normal part of the aging process.
A current good x-ray is not a guarantee that a dog will remain free of hip dysplasia.

However, there are two very reliable methods of predicting which dogs are most likely to have hip problems before their time.
Both methods require x-rays of your pet's hips.

OFA Evaluation:

The Orthopedic Foundation Of America first began evaluating the hips of dogs in 1966.

For a fee, OFA will have three, board-certified veterinary radiologists evaluate an x-ray of your pet's hips taken by your veterinarian and assign the hips a grade.
To receive a permanent evaluation (certification) **the dog must be 24 month old or older.**

But a preliminary evaluation can be done as early as 4 – 12 months of age.
Ideally, you want dogs that have a hip grade of *excellent*.
Dogs that grade excellent are what every breeder desires.
However dogs that grade *good* are also satisfactory pets.

Breeders know this! - The offspring of OFA-certified parents should be less likely (but not guaranteed) to develop hip dysplasia.
But because of the complexity of the disease, hip certification is not an absolute guarantee of this.

The PennHip Procedure:
It was only recently that OFA added a preliminary evaluation to their service.
Until then, dog owners had to wait 2 years before they could know that their breeding dogs had acceptable hips.
This was a major disadvantage.

So in 1993, a veterinarian at the veterinary school in Pennsylvania developed a second reliable technique that could be used on puppies as young as 16 weeks old. It was named the PennHip procedure.
To have your puppy certified through PennHip, a specially trained veterinarian takes three, carefully positioned, x-ray of the dog's hips - one with the hip joint relaxed, and one with it compressed and one with it pulled or distracted.
The less the difference, the more stable the joint and, **theoretically**, the less likely the puppy will be to hip dysplasia.
A numerical formula is used to calculate the dog's "distraction index" and this value is compared to a table giving the acceptable value for the dog's breed.

The PennHip procedure appears to be better than the OFA technique for identifying the best dogs to use for breeding (logic reasoning). (ref)

Are There Things I Can Do To Avoid a Dysplasia Problem?

Nutrition

We think that too rapid a growth rate and excessively fast weight gain make a tendency toward hip dysplasia worse.
This seems to be particularly true in very large breeds.
When pups grow too quickly, the structure of their bones and joints cannot keep up with the rapid growth in their muscle mass, weight and strength. Sometimes, this causes the joints to begin to fail.
So do not "push" your dogs by over-feeding them or feeding them a diet that is too rich in protein.
When you select a puppy, do not select "larger than life" parents that are on the top or exceed normal weight for the breed.
When you select a puppy, choose one that is intermediate size in the litter.
As your dog matures, keep it lean.
Many dogs become overweight shortly after they have been neutered.
The only way to avoid this in non-working dogs is to feed them less or feed them a less caloric diet.

Selection

Although the genetics is complex, purchase pups that are the offspring of OFA or PennHip certified parents.
If this cannot be done, purchase a pup from the second or third litter of parent dogs that have no mobility or joint issues.
These parents would be 3 to 6 years old.
Never purchase puppies if both parents are not available for inspection by a disinterested expert of your choosing.
Ask the breeder for a list of satisfied purchasers of prior puppies from the same dam and sire.

Exercise:

Do not push young dogs to over-perform.

Your pet will do almost anything to please you and it cannot tell you when it is pushing the limits of healthy endurance.
Dogs that are under 12-16 months of age have developed strong muscles but their bone and joint structure has not reached its maximum strength.

How Can I Tell If My Dog Is In Pain?

We have long known that the degree of pathology we see in x-rays does not necessarily tell us how much pain your dog is experiencing.
Some dogs have very dramatic x-rays but appear to be pain-free while others suffer greatly when x-rays show only minor hip changes.
Just as with people, the sensation of pain varies among individuals.
You, rather than your veterinarian, are in the best position to decide whether your dog is in pain and if it needs pain control medications.
(Pet owners in Europe have another option, Traditional Radio-Therapy, that you can read about here)

Signs of pain in your dog are:

Dogs rarely vocalize or yelp when they are in pain.
But they tell you they hurt in other ways:

1) Reduced Activity

This is the most common sign of joint pain.
All dogs slow down as they get older.
But this should not occur until a dog is advanced in years. If your dog is not overweight or ill, it should maintain the activity level it had when it was 1 year old well into its mature years.

2) Difficulty Getting Up and Lying Down

Pain is often greatest when the pet assumes a resting position.
Because of this, dysplastic dogs that are in pain often hesitate to lie down and get up.
The problem tends to be worst in the morning.

3) Difficulty Climbing Up Stairs

Dogs with painful hips will hesitate or refuse to climb stairs that they had no difficulty climbing in the past.

4) Excessive Grooming

Inactive dogs get bored. To pass the time they tend to lick and groom themselves - often to the point of developing a rash or areas of hair loss on their flank, hips and legs.

5) Pressure Calluses and Sores

Inactive dogs often develop bed sores or calluses in areas that bear the most pressure and have the least padding.

These are the elbows and points of the hip. The problem is worst on hard floors.

6) Abnormal Gait

Dogs that have painful hips take shortened steps and tend to hold their rear legs farther forward under their abdomen.

They may swivel their hips characteristically or walk in a bunny-hop fashion.

What Treatments For Hip Dysplasia Are Available For My Pet?

Medical Treatments:

Hip dysplasia or hip problems **that is not too severe** can be managed medically.

This type Hip dysplasia or hip problems **is usually a form of arthritis** and the same treatments that work in humans, work in dogs.

Weight Reduction

When your pet suffers from hip dysplasia, it is very important to lessen the weight the hip joints must carry.

The breeds that suffer most from hip dysplasia are also the beefy breeds that tend to gain weight as they age.

This is especially true if your pet is neutered or spayed.
Your pet's weight is entirely in your control.
First request that a blood T-4 level be run to detect the possibility of thyroid problems.
If that is normal - and it probably is - feed your pet a less caloric diet or feed it less.
This is considerably harder on the owners than it is on the dog.
Even if you later decide to have hip surgery, the outcome is likely to be better if your pet is not over weight.

Padded Bedding And Soft Sleeping Areas
The worst thing for a dog with hip dysplasia is sleeping on a cold, hard floor. Wood floors and carpets improve maters, but the dog will be most comfortable with an over-stuffed dog bed or something similar.
Orthopaedic foam is also excellent.

Warmth
Just as with arthritis in people, dogs seem to be most uncomfortable in damp, cold weather.
A warm room - free of drafts - and a heat source that is fire-safe and cannot tip over is something your pet will appreciate on cold nights.
A wool pet sweater might also help.

Limited Impact When you take your pet for walks and exercise, try to stay on unpaved grassy areas that cushion his step.
Avoid hard packed pavement and stony surfaces.
This will lessen shock-trauma to his hips as he walks or runs.

Limited Exercise
If you pet gets no exercise, the muscles surrounding the hip will atrophy.
This makes a loose joint even looser and aggravates the problem.
So do everything you can to encourage your dog to walk and exercise moderately.
Walking the pet on a leash, swimming, a very slow jog, or a slow treadmill are all fine.

Do not over-do it.
The pet should not feel worse the day after.
If it does, reduce the strenuousness of the activity or shorten the exercise periods.
Chasing balls, catching frisbees and jumping are not good activities for dogs with hip dysplasia.
Activity plans need to be custom designed for every canine patient and modified depending on how your pet is feeling that day.

Modify The Pet's Environment

There will come a time when it becomes too painful for your pet to climb stairs or go outside to relieve itself.
Building a handicap ramp can be helpful and some pets can be paper trained.
You will think of other ways you can make life easier for pets with advanced hip dysplasia.

Physical Therapy

Physical therapy can go a long way in reducing your pet's pain and debility when dealing with hip dysplasia.

Hire a professional or begin by kneading the muscles around the hips with your fingertips in gentle, circular motion.
Gradually work your way around the surrounding muscles.

There is an entire science of pet physical therapy which you can explore.
One of the most helpful forms of therapy for your pet is hydrotherapy and underwater treadmills using the beneficial effects of water to minimize the pain and debility of hip dysplasia.
This form of treatment is quite effective in reducing swelling and pain.
Consult your local veterinarian who knows the limitations of your pet before starting a physical therapy program.
Rely on the advice or assistance of someone who understands these techniques and their limitations and benefits.

Nutrition.
It has been found that puppies that reach their final mature body weight a bit later in life do not develop the degree of hip dysplasia found in puppies that are allowed to eat as much as they will.
The secret is to keep the puppies growing steadily but to feed them approximately twenty percent less than they would consume when fed free choice.

Medications
None of the medications that are available will improve the shape of your pet's hips.
They all function either to reduce pain, or inflammation or both.

Non-steroidal Anti-inflamatory Medications
The same medications that help people with arthritis also help pets.
However, some of the common drugs in the NSAID class that work well in humans may cause serious side effects in dogs.

So do not attempt to give your pet aspirin, ibuprofen or any other over-the-counter human arthritis medication without first consulting with your veterinarian.
Drug companies have developed a large number of NSAIDs designed especially for dogs.

Your veterinarian can provide you with the one he/she prefers.
They are all quite similar in their effectiveness.
A few common ones are Meloxicam (Metacam),Carprofen (Rimadyl), Etodolac (EtoGesic), Deracoxib (Deramaxx) and Ketoprofen.
Dogs on any of these medications need periodic blood tests and examinations to be sure they are handling the drugs well.

Tetracyclines
There have been a few promising studies that suggest that the tetracycline-class antibiotic, doxycycline slows the destruction of collagen which forms much of the joint's structure.

Like antioxidants, there is little or no down-side to trying this medication.

Tramadol

Tramadol is a medication that relieves pain.
Some dogs develop intestinal troubles when given NSAIDs or don't get enough relief from them.
In those dogs, tramadol may help.
It is reasonably priced and usually has very few side effects when given in the proper way.
Unlike NSAIDs, It can be given in combination with corticosteroids.

Gabapenten (Neurontin)

Gabapentin is another medication that helps with chronic pain.
It was originally used in the treatment of epilepsy in humans where it was noticed that it helped with pain as well. In humans, it appears to be more effective in pain due to nerve irritation than due to arthritis or dysplasia.
But some owners and veterinarians administer it.
It is inexpensive and has few side effects when given properly.
It does not help all dysplastic dogs and if it does, it takes several weeks before you can expect any results.

Corticosteroids (steroids)

A point will eventually come when the drugs I have mentioned will not be enough to ease your pet's discomfort.
When that time comes, carefully supervised use of cortisone-type drugs will buy extra mobility and time for your pet.

Corticosteroids are very kind drugs to give when you know you are going to have to have your pet put down soon, but want a little more time together.
The most commonly used ones are prednisone and prednisolone.
There are many powerful steroid medications in this class.
They are all equally effective in decreasing inflammation and pain associated with hip dysplasia.

However, they all have major side effects on your pet's body that might include increased appetite and weight gain, water and salt retention, slowed healing, cataracts, muscle weakness, weakened bones, and increased susceptibility to infections, diabetes and liver problems.
These side effects can be minimized when corticosteroids are given in as low a dose as possible as and for no more than a few days each week.
Do not fear corticosteroid drugs too much.
These medications have saved countless human and animal lives.
Any person with an organ transplant or lupus usually remains on one of them for the rest of their lives.
The secret of success when using them for your pet is to control weight gain through diet and exercise and to use as little of the medication as infrequently as possible.
If your dog becomes entirely pain-free on corticosteroids, you are probably giving too much.
Often, one or two days a week is sufficient to keep your dog happy.
In that way you and your pet can enjoy each other's company for as long as God allows.

"Nutraceuticals"

These are products that are not evaluated by the American Food and Drug Administration (FDA) because they are considered "foods" rather than "medicines".

It is very difficult to find hard data that prove that any of them work or don't work.
Because they are unregulated products for joint problems that have "good days and bad days", it is very hard to actually get a handle on their effectiveness.

None of them are wonder drugs, and none of them will cure any form of arthritis - despite the information that hucksters distribute.
Publication bias, and studies funded by sales teams from the same companies that will profit if you buy their products, keep me sceptical as to their true value.

Because our pets can't tell us if they feel slightly better, I rely on the feedback we get from reliable people taking the same products for similar problems.

Antioxidants

These products are hyped heavily on the internet and sold by many veterinarians.
However, there is very little hard, scientific proof that anti-oxidants improve hip dysplasia or arthritis in animals or humans.
They appear to be harmless and there is no harm in giving them.
The only scientific study that showed a weak positive effect in arthritis was in human rheumatoid arthritis where two of them, beta-cryptoxanthin and supplemental zinc may have been slightly helpful.
Supplemental vitamin C actually made arthritis worse in guinea pigs.

Polysulfated Glycosaminoglycan (Adequan)

This is a product that is given in a series of injections.

Glycosamineoglycans are building blocks of the cartilage that supports the joints as well as the lubricating fluid the joints contain.
Many owners are satisfied with the improved joint function these injections sometimes achieve.

It is an expensive product so many owners decide to give oral glucosamine products in hopes of obtaining the same results.
It does appear that Adequan can be somewhat helpful in slowing the progress of hip dysplasia in dogs - although the improvements were not statistically significant.
However, it would be more convincing if these studies were not paid for by Luitpold Pharmaceuticals - the company marketing the product.

Hyaluronic Acid (Legend)

Hyaluronic acid is also a component of joint fluid.
Theoretically, giving additional hyaluronic acid might help with lubrication of the joints.

However, studies on how effective this treatment is found it was perhaps modestly effective or perhaps not effective at all.

Glucosamine

Glucosamine and chondrotin products supplements are widely used to manage all forms of arthritis.
The jury is still out on these products.
They might be helpful in dogs because some studies found them to be modestly helpful in humans.
But later studies found these products did not help relieve joint pain.
Glucosamine is a special form of sugar that, along with Chondrotin helps the body produce the glycosaminoglycan that lubricates joints and form cartilage.

Omega-3 Fatty Acids

Omega-3 fatty acids (EPA and DHA fatty acids) that are obtained from cold-water sea life seem to reduce inflammation.
So they may lessen the pain of arthritis.
But like glucosamine, the results of unbiased scientific studies in humans with arthritis have been mixed at best.

Other Untested Products

There are a host of other products marketed for arthritis in people and dogs. Most of them are probably safe.
None of them have been shown to be effective.

Should My Dog Have Corrective Surgery?

Several types of surgery are suggested to help dysplastic dogs.
They are all expensive and the results are mixed.
The fact that so many dissimilar techniques are being used on heavier breeds at the same time suggests that none of them give as good a result as one might hope for.
This is because they all target the results of hip dysplasia - not the cause.
The results of hip dysplasia are an improperly shaped hip.

But the cause of hip dysplasia is weakness and looseness of the ligaments and cartilage that hold the hip together.
Because of this, my usual suggestion is to treat dysplastic dogs medically for as long as possible and then opt for a total hip replacement.

Femoral Head Excision or Osteotomy (FHO)
In this surgery, the head and neck of the femur are removed.
After that is done, a flexible, fibrous attachment (pseudo-joint) naturally forms between the end of the femur and the pelvis.
This should allow pain-free use of your pet's leg.

The surgery is straight-forward and simple.
The results are usually excellent when the dog's adult weigh is 45 pounds or less.
It does not work well in heavier dogs.
It can take up to a year for full motion and weight-bearing to return.
But it is a real joy to see these pets racing happily and pain-free once again.

When hip dysplasia affects both legs, I prefer operating on both hips simultaneously.
This forces the dog to use both rear legs soon after the operation and prevents them from just carrying the repaired leg.
In hip dysplasia, it is the friction and grinding of the head of the femur against the socket of the pelvis that causes the pain.
When the head of the femur is removed, the surgeon places muscular and connective tissue between the two former joint surfaces.

As this consolidates with additional new scar and cartilaginous tissue, this pseudo-joint becomes pain free and allows almost natural motion.
The pet will maintain the knee on that leg slightly straighter to compensate for the slight shortening of the femur.
For the first few weeks after surgery, many veterinarians confine the pet to a small cage and have the owner frequently massage the muscles of the leg.

By the fourth to sixth week after surgery your veterinarian may encourage as much light activity as possible to prevent further atrophy (withering) of the muscles of the leg.
Many have the owners passively flex and extend the leg and continue massages four times a day.
Dogs do quite well on three legs so it is difficult to get them to start using the repaired leg.
Sometimes I resort to taping a sock onto their good rear leg to encourage them to use the newly reconstructed joint.
I have also found that swimming really hastens recovery and use of the affected leg.
Within six months of surgery almost all dogs lope about as if nothing had happened.

I love to do this surgery because it is one of the most successful and emotionally rewarding procedures a veterinarian can perform.
Every veterinarian's technique and post-surgical instructions will differ somewhat.
So follow the directions that your surgeon gives you.

Pectineus Tenotomy.
This older technique was popular in the 1970s.
It involves cutting the pectinious muscle of the groin to lessen the pain of dysplasia.
Cutting this muscle was said to decrease the normal pressure that presses the ball of the femur into the acetabular socket.
Some veterinarians thought it might be helpful in certain cases of hip dysplasia.
However, the relief provided was usually temporary and arthritic changes in the joint continued or possibly sped up.
Few veterinarians still perform this surgery.
I do not recommend it.

Triple Pelvic Osteotomy (TPO)
This procedure has been used since the early 1990s.

It works best when hip dysplasia is discovered very early - before degenerative changes and arthritis become noticeable on radiographs. Dogs need to be 7 - 8 month old or older to have this surgery and it generally does not yield good results when dogs are over 12 months old. The bones that form the hip are not mature enough to hold the screws and plates that are used when the puppy is too young.
And the pet will not have the full potential to remodel the new joint structure if it has finished most of its growth.
So the window or time when the surgery is most effective is quite small.
It is also very difficult to perform this surgery on dogs that weigh less than 45 pounds because the surgeon must work in such a tight space.
This surgery entails cutting free the socket or acetabulum at three points (A,B&C) and rotating it so that the pressure of the femoral head is directly into the cup and not pressing on its upper edge.
Metal plates, screws and wire are used to reattach the acetabulum to the pelvis in its new position. Recovery from the operation, which is performed only on one leg at a time, is 6-10 weeks.
Surgeons that perform this operation are quite enthusiastic about the results they obtain.

However, *"Results suggest that JPS and TPO have similar effects on hip joint conformation in dogs with moderate to severe hip dysplasia but that neither procedure eliminates the hip joint laxity characteristic of hip dysplasia or the progression of degenerative changes."*
If you are considering this surgery for your pet, ask the prospective surgeon to discuss these 2007 University of Wisconsin results.

Hip Replacement
A total artificial hip replacement or prosthetic joint is also an option for your pet. It replaces the painful arthritic joint and can be performed at any stage of the disease.
This process has become routine in humans but cost limits its use in dogs.
It is the only technique that works in dogs over fifty pounds with advanced dysplasia.

The modular prosthetic hip replacement system used today has three components, a femoral stem, a femoral head, and the artificial acetabulum.

Each component has many available sizes, which allow for a custom fit.
The components are made of cobalt chrome stainless steel or titanium and ultra-high molecular weight polyethylene or another advanced self-lubricating plastic.

This procedure is quite expensive and only performed at large veterinary centers.
t has a high success rate and changes in the dog's mobility are nothing short of miraculous.
The surgery can be performed on dogs of any weight and at any adult age - as long as their general health is good.

It's biggest disadvantage is its cost.
Hips are usually replaced one at a time.
Often, one replaced hip is enough to restore the pet's mobility.
The technique for total hip replacement in dogs was pioneered by veterinary surgeons at Ohio State University.

Their orthopedic group still performs more canine hip replacements than any other university or private practice in the World.
If you are considering this surgery for your pet, I suggest you start your inquires there .

Juvenile Pubic Symphysiodesis (JPS)
This is a less extensive, less expensive attempt to improve the dog's hip structure.
When the growth in one portion of the pelvis (the pubic symphysis) is surgically halted, a change occurs in the pelvis' shape as the rest of the structure grows.
Theoretically, this should improve hip function by creating a more stable joint.

However, the same report in the January 15, 2007 issue of the Journal Of The American Veterinary Medical Association questioned this.
When the surgery is performed, it must be done when the pup is young (16-20 weeks of age) and after the likely hood of future hip dysplasia is confirmed through the PennHip examination.

Dorsal Acetabular Rim Augmentation (DARthroplasty)
This techniques uses bone grafts to enlarge the lip of the socket (acetabulum) that holds the ball of the femur in place.
We do not yet know how successful this procedure will be.
The positive thing we do know is that if the DAR technique is not successful, other techniques can still be tried.

Deepening Of The Pelvic Socket (Acetabulum), etc.
This alternative techniques is being studied as are others I have not gone over in this article.
None of them have been used long enough for us to know how successful they might be.

Are There Measures That Would Eliminate This Disease?
Our understanding of genetics, genes, and DNA is progressing very rapidly. Perhaps there will be a time soon when we can predict with certainty which parents will produce puppies with hip dysplasia.

But for now, the only defense you have is to insist that breeders have both parent dogs OFA or PennHip certified as "excellent".
If you found that the puppy's grandparents had certified "excellent" hips as well, that would be even better.
If you do this, you will have gone a long way in avoiding hip dysplasia problems in a future puppy.
Laws to outlaw puppy mills and the sale of dogs in pet shops would also help a lot in eliminating this debilitating disease.

So would general education of the public not to purchase dogs and cats from these establishments

If your pet is born with the genes that make it susceptible to hip dysplasia, following my advice regarding feeding, nutrition and exercise should be helpful in preventing, controlling or minimizing the effects of this debilitating disease.
You should also avoid early neutering of your pet; and - most certainly - do not breed it.

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Know this! - This is an X-ray of a two week old puppy.

Look at how far the bones have to grow before they become a proper bony joint.
This is why you should never let puppies jump, walk up/down stairs, over exercise or over train.
Doing too much impact activity at a young age will cause or at least contribute to serious issues later such as hip dysplasia and other orthopedic conditions.

Remember the puppy rule: for every month increase activity by 5 minutes.
For example: **an eight week old puppy only needs ten minutes physical activity a day while a six month old only needs 30 minutes a day of physical activity.**
This includes going for a walk, training, playing fetch, running, playing with other dogs etc.
This because the hips and joints are nor fully developed and connected yet.

Enjoy your new puppy and remember to keep it safe up to 18 months.

The hips of an AMPT is only fully developed and functional for the work it shod do at 2 years of age – exposing a young dog before this time to strenuous keeps and conditioning programs will cause hip and joint problems later in life.