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Arthritis - joint problem.

Arthritis can occur in any joint, from the neck to the toes, although it's commonly found in the hips and elbows.
Arthritis occurs in dogs in several ways.
It can come about due to an injury to a joint as an inflammatory disease of the bone due to improper shape or conformation improper nutrition
due to joints wearing out due to the passage of time.
Arthritis is one of the more common health and insidious painful diseases issues the working dog face today.
Arthritis and joint pain can have a profound impact on your dog's quality of life and known to be a continuous progressive joint disease.

Arthritis is the most common health problem in older dogs – any joints … feet knuckles – knees – hips - elbows.
So if you own a dog, you will probably have to deal with it someday.

The most common cause is the simple wear and tear you're dog's joints undergo over the years - they simply wear out.

When we consider how soon mechanical mechanisms wear out, it is really remarkable how long natural bone joints can function.
Nature's creation solution to motion are biological hinge meginism – two slick, smooth surfaces coating the bones that form each joint.
The ends of the bones that form all movable joints are formed of a cushiony layer of cartilage that is coated by a slick slippery membrane …called the "synovium".
To reduce friction, the space in between is filled with an "oily fluid" - and the whole structure is bound together …with a series of "fibrous tissue and ligaments".

The secret to the long-term success of this wonderful created apparatus is that its components are all living and capable of repair. But as the dog age, this repair process becomes less and less successful and makes errors.

With years of repeated movement, several things begin to happen.
The fibrous elastic sheets (fascia) and ligaments begin to stretch causing looser, more traumatic joint motion … allowing the bones that form the joint to rattle slightly as they move.
This in turn bruises and erodes the joints smooth surfaces causing inflammation.
As these surfaces continue to move, the inflammation causes new bone to be laid down in the way of motion … where it does not belong causing pain and bone to be reabsorbed from where it is critically needed.
This is called remodelling and it is a vicious painful cycle.
Taken all together, this is what arthritis is.

The problems that lead to arthritis begin early in your dog's life.
The problems that lead to arthritis begin quite early in the dog's life but are not noticeable at that time.

Your choice in "breed type" will plays an important role.
At choosing a breed of dog like the high pry drive working dog the APBT - bred for abnormal bone structure and athletic and competing abilities … mean that arthritis might occur sooner than in most other breeds of dog – that is by over working these dogs in keep for competition.
Accident, or born / genetic bone misaligned.
When a particular joint is damage through accident, or born misaligned, it may not be able to repair itself.
When the dog was born with abnormally shaped bones or abnormally lax joints (dysplasia), arthritis may appear in its youth.
Once arthritis is established in your dog, <u>no matter what the cause</u>, the <u>treatment options available for your dog will be the same.</u>

There are ways you can postpone or avoid arthritis when you make a decision to purchase a dog.

Arthritis also runs in families or lines of dogs – in the genetics.

If the parents (Sire and or Dam) of your dog did not develop arthritis until a ripe old age, your dog probably won't either.

What is actually happening in my dog's joints that is causing the pain?

Usually, veterinarians and pets benefit from studies conducted in animals that were designed to understand and treat health problems in people / humans.

However, when it comes to arthritis treatment, most veterinary knowledge has come from studies done in humans.

That is because you as a human can tell your doctor much better when treatment relieves you from pain and debility, than your dog can tell your veterinarian.

That, and a lack of funding, is why so few significant, independent studies of arthritis have been done in dogs.

Luckily for our dogs, there appears to be no difference in the processes that contribute or slow arthritis in dogs and their owners.

That is why most of the references used link to studies done in humans.

But even those studies often have perplexing, contradictory, results.

Anatomy.

A normal joint is lined with hyaline cartilage, which is the covering over the end of the bone.

It provides an almost frictionless surface for the bones to articulate, and also acts as a shock absorber.

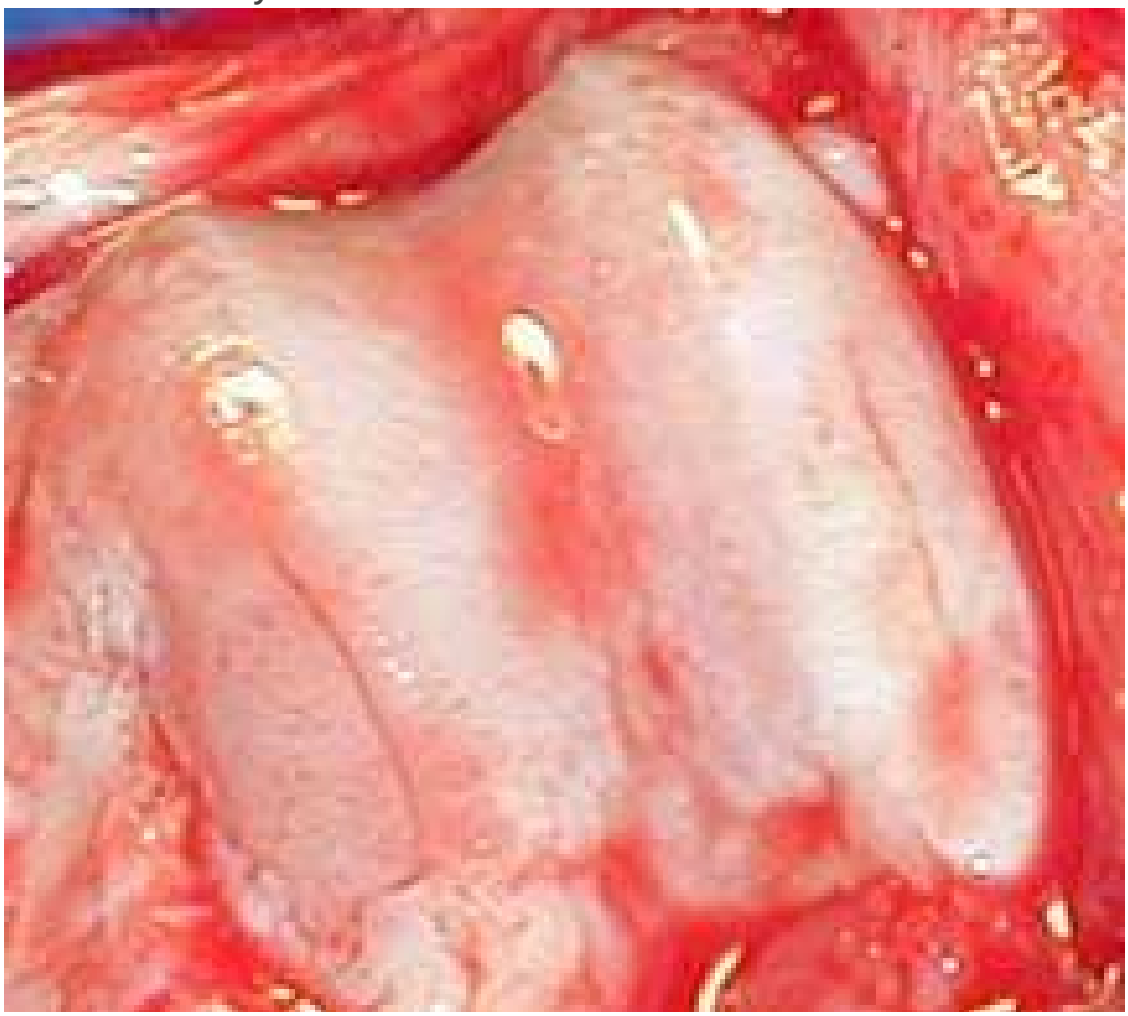
Hyaline cartilage is comprised of chondrocytes, proteoglycans, and collagen.

A normal joint is encased in a fibrous structure called the joint capsule.

The joint capsule helps stabilize the joint and keeps the cartilage bathed in synovial fluid.

Ligaments, which attach bone to bone, also provide joint stability.

This is what cartilage looks like in the knee joint.
It is glistening because it is very smooth and has a lubricating layer over it called synovial fluid.



This picture is from an actual surgery on the knee of a dog with a ruptured cranial cruciate ligament.
The ridge of bone running vertically at the left is arthritis.

Compare its roughened surface to the picture above.

Cause.

The cause of this complex and multi factorial disease can be primary or secondary.

Primary OA results from normal stresses acting on abnormal cartilage.

Secondary OA is more common, and results from abnormal stresses acting on normal cartilage, such as an unstable joint caused by canine hip dysplasia ... fragmented coronoid process, un-united anconeal process, patellar luxation, or a ruptured cruciate ligament.

Some of the factors that can cause OA include excessive exercise, obesity, poor nutrition, trauma, immune reactions, and genetic predispositions.
The fists radiograph is from a normal shoulder joint.
The second has an abnormal flap of cartilage at the arrow.
This is known as osteochondritis dissecans, and is a primary OA.
Without this radiograph, you never would have known this limping dog had this problem.

Damage to cartilage might occur as one event, or be the culmination of many small events over years.
As swelling occurs and the joint capsule becomes stretched pain occurs.
Your dog will use the joint less because of this pain, leading to muscle atrophy and the inability of the surrounding tendons and muscles to support the joint.
As the muscular support of the joint weakens the joint capsule, ligaments, and cartilage become further stressed and stretched, leading to even further pain.
At this point the body releases chemicals called inflammatory mediators, (the therapy laser works on these mediators) which further damage the cartilage … and add to even more swelling.
It is obvious that this rapidly becomes a vicious cycle leading to debilitating pain.
When OA progresses to the point that you notice your dog in discomfort or pain the damage to the joint might be irreversible.

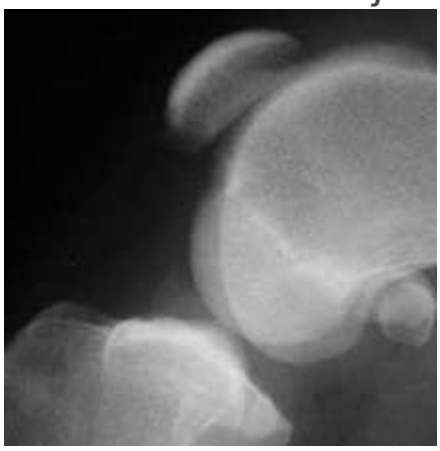
Signalment.
OA is commonly diagnosed in older dogs.
Some breeds are prone to getting it because of the conformation of their joints.

History.
Most dogs show a reluctance to run or move about.
Some will be reluctant to go up or down stairs, or might even be limping.
As the disease progresses these dogs might be in overt pain and lose their appetite.
Some of these symptoms occur in other diseases, notably hip dysplasia and intervertebral disk disease.
These are treated in similar ways in most cases, in different ways in other cases, so a proper diagnosis is imperative.

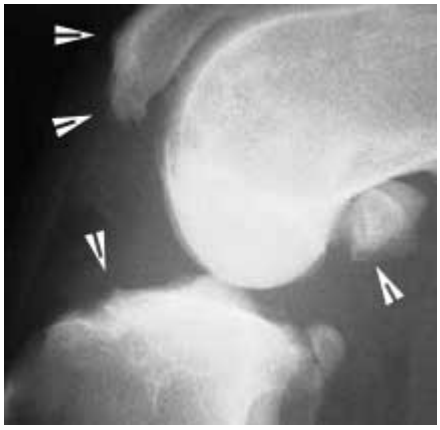
Physical exam.
In some dogs there are no abnormalities detected during a physical exam.
Pain or discomfort might be found by palpating a joint or pushing on the mid or lower back.
We might feel grinding of joints (crepitus), a swollen joint, abnormal bone formation and roughened bones, or inflammation at the joint.
Dogs with longer standing OA might show atrophy of muscles.
There might also be subtle signs during the neurologic part of the exam.

Some dogs are so distracted during an exam (this happens to us people commonly) that they do not exhibit signs of pain when touched in painful places.
This is why we need some basic diagnostic tests.

Diagnostic tests.
Radiography is an important diagnostic test to perform on a dog suspected of having OA.
Even though a radiograph can be normal in a pet that has OA, it is a substantial help in verifying the diagnosis and determining the degree of involvement.
There are many diseases that can mimic the symptoms of OA, so a radiograph should be taken on every suspected OA to eliminate these other causes.
This is a normal knee joint radio graphically.

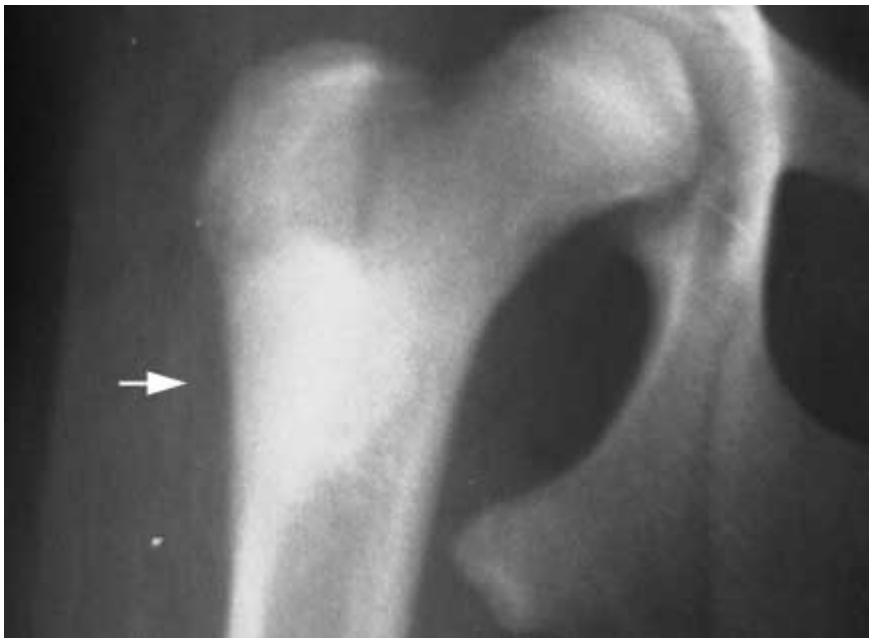


This one has arthritis.
The arrows point to all of the rough edges that are indicative of OA.
Compare these rough edges to the smooth edges on the radiograph above.
In addition, the bone has a stronger whitish appearance, another indication of OA.

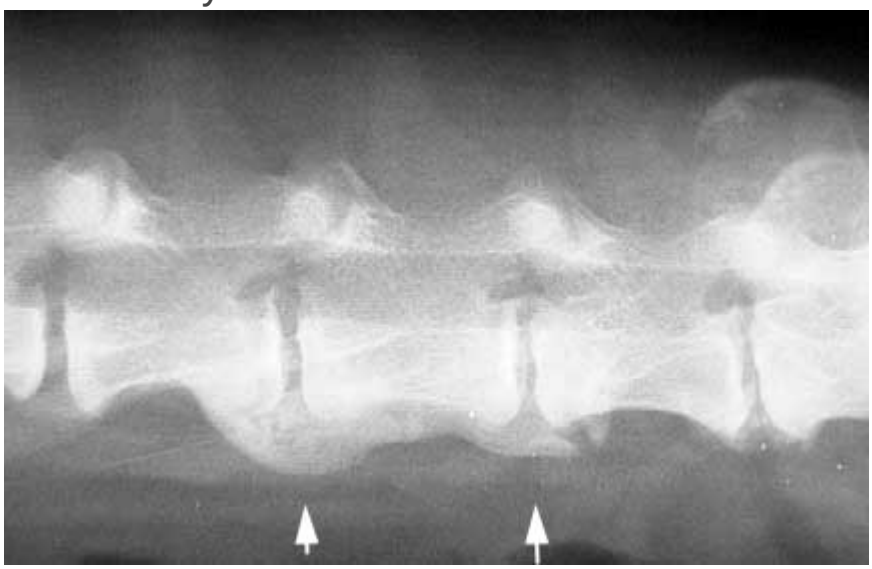


This dog was originally suspected of having arthritis based on a history of soreness in the hip area.
Radiographs revealed a different story, as can be seen at the arrow at the far left of the radiograph.
The white circular area in the bone has the potential to be many things, some of them serious, so a biopsy is need to know for sure.

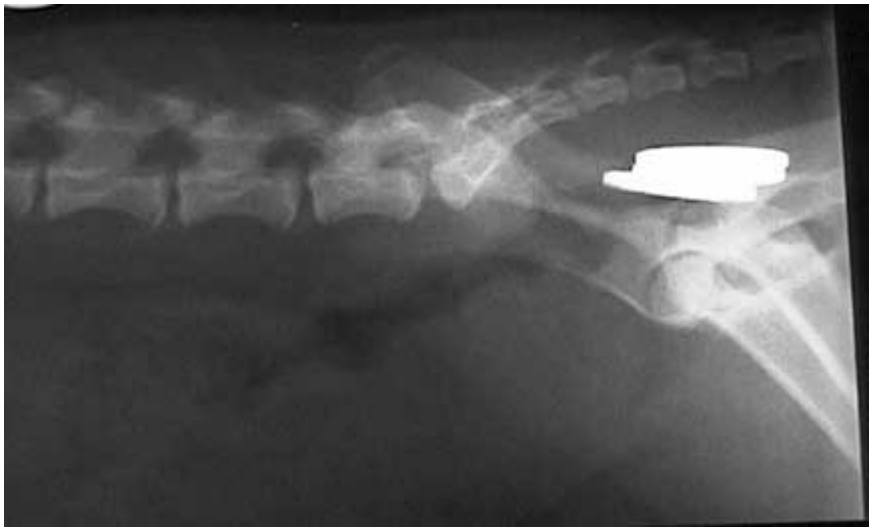
A close-up view gives you a better idea of this dog's problem.



This form of OA is called spondylosis, which is arthritis of the vertebrae in the spine.
It is very common as dogs age and causes substantial discomfort and even urinary and bowel incontinence.



This dog was sore around its rear quarters when petted by the owner.
This could easily be arthritis, but as you probably already figured out, something else was amiss.



Did you figure out what is going on?
Those circular white objects towards the top right of the radiograph are 3 coins in the rectum!
Seems like a safe place to store your money.
A very important differential when diagnosing OA on a radiograph is a bone tumour.
This one is on the femur (thigh bone).
This dog had symptoms of muscle atrophy and limping on this leg.
If a radiograph had not been taken these symptoms could have easily been mistaken for arthritis.

The other important differential on radiograph is a bone infection, called osteomyelitis.
The fuzzy or roughened edges at the arrows is the infection.

The incorporation of digital radiography at your vet's practice gives him substantially more detail on a radiograph.
This is easily seen in the spine radiograph below.

Treatment.
Treatment of OA initially includes correction of any underlying primary diseases such as surgical correction of a torn ligament … or arthroscopy to remove a cartilage flap.
Once any primary disease has been addressed, the goal of treatment is to slow the progression of OA and to keep your dog comfortable.

First signs of arthritis.
Reluctant to move about -become less active are the tell-tale sign of arthritis in older dogs.

As your dog's joints age, it will become more reluctant to run or play for long periods.
It won't bound up and down the couch and bed or stairs like it used to and, on rising in the morning, it may be stiff and even limping.
These changes almost always come on very gradually. It is easy to ignore or not notice them at first.

Slowing down isn't only related to your dog's joints.
Large dogs and active ability dogs, the ones that usually develop arthritis earlier, were bred to be very pain-resistant and stoic.
So they won't let you know that they are in pain until their arthritis problem is quite advanced.
One common symptom of age-related arthritis is that joints tend to be stiffer and more painful after periods of rest … and that pain tends to work out during the day.
By evening, your dog may be its old self again.
Arthritis problems tend to be worse in overweight dogs.
Some of their panting after a long walk can be due to arthritis pain **and not just** the overheating … and out-of-shape problems that obesity produce.

Cold wet and sleeping surface.
Cold and wet winter make the problem worse as well - can be unbearable for our older dogs that experience the ravages of degenerative joint problems … especially sleeping on cold concrete, cold and wet surfaces – comfortable warm bedding is needed protected from the elements.

What tests to confirm arthritis?
Observe the dog's actions.
Your veterinarian has learned to be a very good judge of the subtle signs that dogs give to tell us that they are in pain.
It may be just a worried look in their eyes when the veterinarian overly flexes their joints.
Or you dog may withdraw its leg, or even growl or snap.

You veterinarian will probably ask you to lead your dog around the examination room to observe its gait and locomotion.
Over their career, vets get very good at that.
The veterinarian may notice that the major muscle masses of your dog's legs and spine have shrunken (atrophied) due to disuse.
Your dog may wince when areas of it spine are palpated.

But the key tests your veterinarian will perform are x-rays.
Depending on how subtle the changes are, it may take more than a single x-ray film.
X-rays of advanced arthritic joints are very distinctive.
Most veterinarians will set these x-rays up in the exam room and point out to you the important bone changes that they are seeing.