

# Canine Elbow Dysplasia

Associated Terms:

Fragmented Medial Coronoid Process (FMCP), Fragmented Coronoid Process (FCP), Ununited Anconeal Process (UAP), Elbow Incongruity, Osteochondrosis of the Elbow.

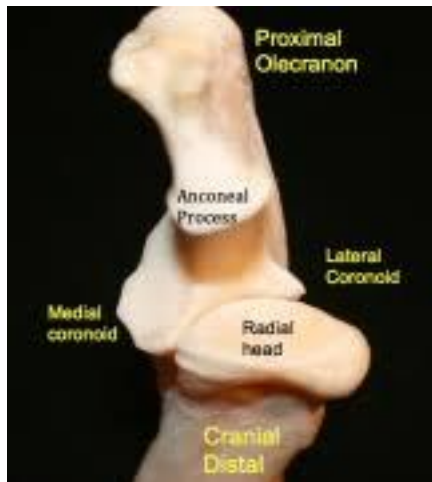


Figure 1; The lower bones of the elbow of the dog. The radius is at the front & the ulna at the back.

## OVERVIEW

Elbow Dysplasia (ED) is a condition involving multiple developmental abnormalities of the elbow joint. The elbow joint is a complex joint made up of 3 bones (radius, ulna & humerus). If the 3 bones do not fit together perfectly due to growth abnormalities, abnormal weight distribution on areas of the joint occur causing pain, lameness & the development of arthritis. Elbow dysplasia is a disease that encompasses several conditions grouped into medial compartment disease (fragmented coronoid process (FCP), osteochondrosis (OCD), joint incongruity & cartilage anomaly) & ununited anconeal process (UAP). The cause of ED in dogs remains unclear. There are a number of theories as to the exact cause of the disease that include genetics, defects in cartilage growth, trauma, diet, & so on. It is most commonly suspected this is a multifactorial disease in which causes the growth disturbances.

Elbow dysplasia is an inherited condition that can occur in most dog breeds but is most commonly seen in large to giant breed dogs. It has been noted to affect both elbows in up to 80% of patients. Bernese Mountain Dogs, German Shepherds & Golden retrievers among others are predisposed to UAP while Labrador retrievers, German Shepherds & Golden retrievers have an increased predilection among other breeds for developing medial compartment disease. Unfortunately, once the elbow joint has been damaged through either cartilage loss, medial compartment disease or an ununited anconeal process, inflammation & further cartilage damage occurs. Ultimately this causes progressive arthritis of the elbow joint leading to pain & loss of function.

## SIGNS & SYMPTOMS

## Dogs

affected by elbow dysplasia often show signs from an early age, typically from 5 months on, but some may first be diagnosed after 4–6 years. Affected dogs develop a front limb lameness that typically worsens over a period of weeks to months. Lameness is usually worse after exercise & typically never completely resolves with rest. Often both fore legs are affected, which can make detection of lameness difficult, as the gait is not asymmetric. When both elbows are involved, the dog usually becomes unwilling to exercise for long periods or may even refuse to complete a walk.

## DIAGNOSTICS

Diagnosis of elbow dysplasia is usually performed with a combination of clinical examination & x-rays. Usually, the dog has pain on fully bending or extending the elbow & often your vet will want to watch your dog walk or trot to detect any lameness. X-rays will typically show signs of arthritis but may also show the presence of small bone fragments in the joint or an ununited anconeal process (Figures 2 & 3). Your vet may also choose to refer you to a specialist veterinary surgeon for more advanced diagnostic procedures to be performed. This may include CT scans, MRI scans, or arthroscopy (Figures 4 & 5).



Figure 2: An ununited anconeal process (UAP) in an 18-month-old dog. Note the large unattached fragment at the top of the joint (arrow).



Figure 3: Advanced arthritis.  
Note: new bone deposited around the joint (arrows) & the increased density of the bone under the joint (cross).



Figure 4: Arthroscopic image of a fracture coronoid fragment (arrow) with severe cartilage damage to the humerus (diamond) & ulna (cross).



Figure 5: A 3D reconstruction from a CT scan showing a medial coronoid (arrow).

## TREATMENT

Treatment depends on the severity of the disease in the elbow. In most cases surgery is recommended, but your vet may recommend medical management if the problem is very mild or so severe that the joint may not likely benefit from routine surgery. Treatment will depend on the primary cause of the elbow dysplasia. Often surgery is best performed arthroscopically, but conventional open surgery can also be done. Depending on the individual dog's elbow problem surgery may involve:

- Removal of any coronoid fragments & removal of loose cartilage (Figure 6) (FCP).
- Surgical alteration of the elbow joint to shift weight away from damaged areas (Figure 7)
- Reattachment or removal of a united anconeal process (UAP) of the medial joint compartment (Figure 8)
- Correction of joint step/incongruity; this is usually done by cutting the ulna to re-establish elbow congruence.
- Joint replacement if the elbow is severely diseased.



Figure 6: Removal of a medial coronoid fragment by arthroscopy.



Figure 7: A proximal abducting ulnar osteotomy. This is one of two procedures used to shift weight away from the damaged part of the joint to a health part of the joint.



Figure 8: An X-ray shows a repaired UAP in a 6-month-old German Shepherd.

## AFTERCARE & OUTCOME

Surgery aftercare will depend on the type of surgery performed & your vet will advise you of what is required. In general, your dog will need to be quiet & confined for a period of time, usually first week then have your pet on chest harness & short leashed to control your pet's exercise activity. Your pet should NOT go faster if you were holding the short leash. Your pet's speed should match leisurely, controlled walks.

The outcome will vary between dogs, but in general the milder the disease & the earlier it is treated, the better the long-term outcome. Most dogs will benefit from surgical treatment even if disease is more advanced, but unfortunately once arthritis is established it will slowly progress regardless of any treatment. On average, with treatment 85% of cases will show some degree of improvement in lameness & comfort despite progression of arthritis on x-rays. The aim of treatment is to slow the progression of arthritis & prolong the patients' use of the elbow. Unfortunately elbow dysplasia cannot be cured but it can be well managed, & our patients can have a good long-term prognosis & outcome with a combination of surgical & medical management.

## BANDAGE CARE

If your pet has splint for final fracture treatment or if a bandage was applied after surgery to help with pain & swelling, careful monitoring & maintenance is necessary for safe & effective bandage wear. Major problems can result from simple bandages; please do NOT hesitate to call your vet &/or vet surgeon if any problems are noted. Monitor the bandage for slipping or damage from chewing, etc. If it changes position or becomes wet or loses its integrity, serious problems may occur with healing or new problems with pressure sores may develop. Please call your vet if any changes in bandage position occur; the bandage may need to be replaced.

If the end of the bandage is open, check the 2 central toenails TWICE daily. They should be close together. If they are spreading apart, this indicates toe swelling which can result in serious complications & the bandage needs to be assessed by your vet within 4-6 hours.

The bandage must be kept clean & dry. Place a plastic bag on the end every time your pet goes outside. Remove the plastic covering when indoors.

If the bandage gets wet or foul odor coming from the bandage, it will need to be evaluated within 2-4 hours; serious skin problems may develop.

We strongly advised that you do NOT modify the bandage in any way. Adding tape or other wrappings can seriously compromise the safety of the bandage/splint. If you are concerned about the security or integrity of the bandage, please return to your vet &/or vet surgeon for re-evaluation & re-application as needed.

Please know that bandages & splints can cause very serious complications. They can be an effective treatment tool for fracture healing & pain control, but careful monitoring & appropriate follow-up must occur. If you have any questions or concerns related to issues outlined above or in general regarding bandage/splint wear, please do NOT hesitate to call your vet &/or return for evaluation. Your pet cannot tell you that the bandage hurts or is uncomfortable; you need to be attentive to any change.

## ACTIVITY RESTRICTION

Confine your pet as directed by your veterinary surgeon; this often includes confining him or her to one section of the house on carpeted floors. Use baby gates to prevent access to slippery floors or stairs. Do NOT allow jumping on/off furniture. Confine to a small area, room, or crate when unattended. Do NOT allow any playing, running, or jumping. For dogs, use a short leash with a chest harness when going outside for bathroom breaks. The best way to confined cats is to have a large dog crate where food & liter can be place. A small room can also serve as a confined are, but cat cats like to jump, so furniture should be removed.

Your pet will feel like fully using the leg before the fracture is sufficiently healed.

Please continue the restriction during this time until bone healing has been confirmed with x-rays. Puppy or Kitten fractures x-ray follow-up at 4-6 weeks & adult fractures at 8-10 weeks. Failure to do so may cause serious healing problems.

## ASSISTING YOUR PET

Your pet may need assistance to stand & walk in the first few days or weeks following his or her injury. Even if your pet is able to move on his or her own, it is often wise to provide light assistance until he or she is completely stable, especially on slippery surfaces or when going up or down a short flight of stairs. Dogs will often accept help; cats rarely do. Some dogs will fight the assistance & refuse to move. Adjust your efforts as needed to help your pet without creating more difficulties for both of you. Some pets will need to be held up strongly, others will just need light sling support to prevent slipping or falling to one side.

For front leg injuries, a simple sling can be created out of 2 straps. One strap goes under in front of the right leg & comes out behind the left leg; the other strap goes under in front of the left leg & comes out behind the right leg. The straps should cross on the underside of the chest, & you hold all four ends as a handle over the top of the chest. Adjust the strap length to allow you to stand comfortably upright as you assist your pet. Variations on this sling technique can be customized as you see fit.

For back leg injuries, a similar sling can be created out of 2 narrow straps or 1 wide band. The 2 straps can be looped under each back leg & held up like you are pulling on a pair of pants; adjust the length of the straps to allow you to stand comfortably as you assist. A sling support will be



provided for your pet. The sling support is placed underneath the belly to provide additional sling support during walking.

## MEDICATIONS

Give any prescribed Rx as directed. Do NOT give human pain medication to pets without first consulting with a veterinarian. RXs may include antibiotic, anti-inflammatory, pain &/or sedation. Medications will be discussed at your pet's end of day or the next day discharge appointment with your vet team.

## FOLLOW-UP

Patients with trauma severe enough to break bones can often have internal injuries as well; sometimes these injuries are NOT apparent until days or weeks after the incident. Have your pet checked by a vet as soon as possible if any signs of illness such as vomiting, trouble breathing, prolonged inappetence, change in urination or pale gums are noted. Please contact us immediately if any of the following are noted:

- A) Swelling or discharge from the incision
- B) Increase in lameness occurs.
- C) Change in position or angle of the limb
- D) Bandage problems occur.

Please schedule an appointment for a follow-up & suture removal 14 days after surgery & follow-up radiographs need to be scheduled ~4-6 weeks (puppy/kitten) & 8-10 weeks (adult) after surgery.

## PROGNOSIS

The prognosis for generally good but depends on the severity & location of the fracture. Potential complications may include wound infection, osteomyelitis (bone infection/inflammation), delayed union, non-union, arthritis, implant loosening or breakdown of the surgical repair from excessive early activity of the patient.

## PHYSICAL THERAPY

When a bone is fractured; many things happen that make a leg function poorly over the fracture healing period. Muscles, nerves & blood vessels are damaged; the result is pain & poor muscle function. If a leg is weak &/or hurts to stand on, an animal won't use it properly. When a leg is NOT used for several days to weeks, joints stiffen up, muscles get smaller & bone healing is delayed as well.

Physical therapy during fracture healing uses methods aimed at improving comfort & leg use without harming bone healing. Some of the simpler methods can be used at home; the more advanced techniques are used by veterinary physical therapists under the guidance of your veterinary surgeon. Careful coordination between your pet's veterinary surgeon & physical therapist can result in excellent outcomes & an efficient return to normal leg function.

### • COLD THERAPY

In the first week after injury, applying cold packs to the fracture site will reduce inflammation, swelling & pain; this will make your pet more comfortable & allow him/her to use the leg earlier.

### • PASSIVE RANGE OF MOTION (pROM)

In the first month after injury, flexing & extending the joints of the injured leg will maintain joint health while your pet is NOT using the leg fully. Initially this range of flexion & extension will be quite small; the goal is to move the joint without creating pain. As healing progresses, more stretching can be applied to reach toward a more normal range of joint flexion & extension.

- **MASSAGE THERAPY**

After the initial stage of painful inflammation subsides, you may be instructed to begin massage therapy on the skin & muscles around the injured bone. This therapy will prevent tough scar tissue from developing that will later prevent normal movement of the leg & it also offers pain relief in the intermediate period of healing.

Your veterinary surgeon should be able to tell you what to expect with healing. As a general statement, fractures need a minimum of 4-6 weeks in young puppies & 8-10 weeks in adult to older pets to heal sufficiently & begin to progress to normal activities.

We don't have the luxury of telling our patients to "take it easy" & "stay off of it," so we must rely on you to impose the restrictions even when your pet is begging to romp & play.

## **Home Preparation for Your Pet's Home Recovery**

Prior to your pet coming home, you should determine where you are going to confine your dog or cat during this post-operative period. Making your dog or cat as comfortable as possible is as important as having a good rehabilitation/recovery plan.

As your pet's mobility is to be restricted, we recommend that you utilize the following:

- Dog or cat crate that is large enough that he/she can stand up & turn around (only pets that are NOT self-destructive or anxious being kennel for long period of time).
- Gated off area such as the kitchen, laundry room or etc.  
(room(s) should NOT have furniture to jump on or windows to look out).
- Confinement to a safe, injured proof room.

Surfaces such as hardwood floors, tile & linoleum can be very slippery. We suggest that you place some throw rugs with rubber backing or yoga mats on these surfaces to make it easier for your dog or cat to walk around.

## **HOUSE RULES**

- NO jumping at all! No jumping on/off the bed/couch/furniture/windows! No jumping on you! Overextension of the knee could compromise the repair of your dog's or cat's leg & delay the healing time.

- NO active play! Refrain from active play with your dog or cat & do NOT allow him/her to play with other dogs or cats until your vet tells you otherwise (likely after the 6 weeks (juvenile) or 12 weeks (adult) post-operative x-rays to confirm bone healing).

- Stairs: stairs should be limited to a short flight to get in or out of the house. Your pet needs to be on a short leash & slowly guided up & down 2 – 3 stairs. If you have stairs in your home, limit your dog's or cat's access to them with something like a baby gate to prevent unsupervised use of stairs. Longer flights of stairs should NOT be used for strength training but are allowed with supervision after the 4 weeks (juvenile) or 8 weeks (adult) post-surgery as long as your dog or cat is consistently using their leg & is NOT allowed to run or jump up the stairs.

## POST FRACTURE SURGERY

### Home Recovery Program Rehabilitation Protocol for Patient with Long Bone Fractures

Treatments/Modalities	Day 1-7	Day 7-21	3-8 Wk	8-12 Wk and Beyond
Pain medications	As directed	As directed	PRN	PRN
Cryotherapy	10-15 min 3 times daily before walks or exercises First session immediately after surgery	Use after exercise for 15 min	PRN after exercises	PRN after exercises
Heat therapy		Apply heat to the adjacent muscles 10 min before PROM or exercise	As before 10 min twice daily	PRN
Massage	Twice daily for edema from toes toward heart	Continue twice daily	Massage adjacent muscles before active exercise	Massage adjacent muscles before active exercise

PROM	Gentle joint flexion/extension 10 reps, 3–4 times daily Elicit flexor reflex by toe pinching	Continue flexion and extension with mild resistance 10–15 reps 3 times daily	Continue PROM as previously described up to 4 wk	
Laser therapy	Daily or every other day for first week	Every other day for first week then twice weekly	PRN	
Walks	At 5 d start slow controlled leash walks for 5 min twice daily to encourage active ROM	Increase each walk by 1–3 min each week	Gradually increase to 10–15 min twice daily	20– to 30-min walks twice daily including 10 min of incline work as long as healing has taken place

Underwater Treadmill <sup>a</sup>		10–15 min once daily after day 10— incision healed	15–20 min daily	20–30 min 3 times weekly
Stairs <sup>a</sup>			Likely 6+ weeks after surgery Start with one flight and add one flight per week	Work up to 5 flights twice daily
Cavalettis <sup>a</sup>			5–10 reps over 5 rails once daily	10–15 reps over 5 rails twice daily
Swimming <sup>a</sup>			10–15 min with breaks daily	20–30 min once to twice daily

Please see special instructions for Distal Femoral Physal **Fracture**s regarding bandaging and rehabilitation.

*PRN*, As needed; *PROM*, passive range of motion; *ROM*, range of motion.

If you would like assistance with your pet's exercise recovery, please let your veterinary team know so we can provide a referral to a local veterinary physical rehabilitation center. If you have any questions, please feel free to ask your primary vet &/or veterinary surgeon.

TREAT Veterinary Surgery Service

Dr. Le-Nguyen, DVM, SAS (GPCert Canine/Feline Surgery)

(Practice Limited to Surgery)

(916) 230-8103

[TREATVeterinarySurgeryService@gmail.com](mailto:TREATVeterinarySurgeryService@gmail.com)

[TREATVeterinarySurgeryService.com](http://TREATVeterinarySurgeryService.com)