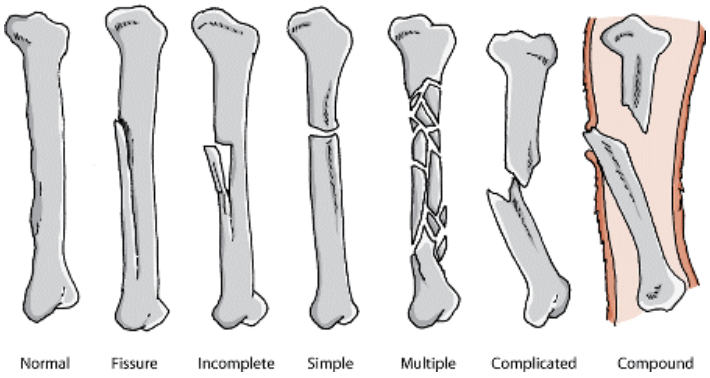
Blue Springs
ANIMAL REHABILITATION CENTER

Fractures

Fractures occur when abnormal stress is placed on a bone, causing it to crack or break. Fractures in pets are often caused by major trauma and usually require surgery to repair. Surgical stabilization of fracture sites is accomplished using various surgical implants, such as pins, wires, plates or screws. The main goal of surgery is to restore broken bones to their original anatomic position and rigidly fix them in place while healing occurs.

To simply the treatment approach, fractures are classified into several categories:



- *Incomplete* - a fracture does not extend around the circumference of the bone; most common in young animals
- *Complete* - the fracture extends through the full circumference of the bone, creating two or more bone fragments. Complete fractures are further described based on the shape of the break:
    - *Transverse (simple)* - the break is straight across the bone at a right angle to the length of the bone

- *Oblique* - the break is at a diagonal across the bone, creating two bone fragments with sharp points
- *Comminuted (multiple)* - the break is in three or more pieces of varying shapes

"Open fracture" refers to a fracture that results in an open wound in the skin. This can occur when the broken bone penetrates the skin or when an object goes through the skin and breaks the bone. If there is no open wound near the fracture, it is called a "closed fracture".

Diagnosis

Following a limb fracture, a pet will often demonstrate severe lameness of the affected limb - Many pets will hold up the affected limb, refusing to put weight on it to walk or stand. Depending on the location and severity of the fracture, however, some pets are able to bear some weight on the affected limb. Pets that have sustained major trauma (hit by car, falling from a height) may have more than one broken limb, and may be unwilling or unable to stand or walk. It is common to note swelling, pain, or abnormal movement of a fractured limb.

Limb fractures are definitively diagnosed through x-rays. Pets will often require pain control and sedation to achieve diagnostics x-rays of painful limbs.

Treatment

Closed fractures should be stabilized within 2–4 days of the trauma, while managing the pets pain in the meantime. Open fractures, however, should be managed more urgently, with an initial surgery to clean the wound and bone within 8 hours of the injury, followed by a stabilization surgery in the following 1-2 days.

Upon initial presentation and diagnosis, the fracture site should be temporarily immobilized with the use of a splint extending from 1 joint above to 1 joint below the fracture site. Immobilization of bone below the elbow and knee is fairly effectively achieved with a split, however, the upper limb can more challenging to manage, as the shoulder and hip are difficult to splint. Fracture of the upper limbs are typically better immobilized with the use of a sling or crate confinement of the pet.

Surgical Fracture Repair

Fracture sites need to be immobilized for extended periods of time to allow healing. The ideal method of surgical repair is dependent on the location of the fracture, type of fracture, age, size and activity of the pet, etc. Some possible surgical fracture repair techniques include:

- External coaptation - a **splint or cast**; applied to the outside of the limb; good at resisting bending forces and fair at resisting torsion and compression forces
- External fixation - a surgically applied device that is attached to the bone with pins that exit through the skin. These pins are connected to a rigid bar with clamps to “splint” the bone on the outside. This method is very good at resisting bending, compression and torsion forces
- Internal fixation - surgically applied devices implanted inside the bone or on the surface of the bone. Various devices are available and offer different results against the various forces such as plates, screws, nails, pins, wires.

Aftercare Rehabilitation

Bandage Care

If your pet has splint or cast for final fracture treatment or if a bandage was applied after surgery to help with pain and swelling, careful monitoring and maintenance is necessary for safe and effective bandage wear. Major problems can result from simple bandages. Monitor the bandage for slipping or damage from chewing, etc. If the bandage changes position or becomes wet, serious impairment of healing may occur. If the end of the bandage has been left open by the surgeon, check the two central toenails twice daily - They should be close together, therefore, if they are spreading apart, it is likely that swelling is present. The bandage should be assessed by a veterinarian within 4-6 hours. The bandage must be kept clean and dry. Place a plastic baggy on the end every time your pet goes outside. Remove the plastic covering when indoors. If the bandage gets wet or you notice any bad odor, it will need to be evaluated within 4-6 hours.

Activity Restriction

The instruction provided by the surgeon regarding activity restriction should be closely followed. It is likely, following fracture repair, the pet will need to be confined to one area of the house. Ideally, pets should remain on carpeted floors to prevent slipping. Post-opertively, pets should be preventing from jumping onto/off furniture, playing or running. Dogs should be taken outside for bathroom breaks on leash only. 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. Failure to do so may cause serious healing problems.

Assisting Your Pet

Post-operative fracture repair patients will likely require assistance to stand and walk in the first few days or weeks. For front leg injuries, a simple sling can be created out of two straps: One strap goes under in front of the right leg and comes out behind the left leg; the other strap goes under in front of the left leg and comes out behind the right leg. The straps should cross on the underside of the chest, with all four ends held as a handle over the top of the chest. The length of the straps will need to be adjusted to allow comfortable upright standing of the assistant.

For hind limb injuries, a similar sling can be created out of two narrow straps or one wide band. The two straps can be looped under each back leg and held up, similar to pulling on a pair of pants. Alternatively, the wide band of cloth can be used as a sling under the belly from one side to the other just in front of the back legs.

There are several sling-type products commercially available that are specifically designed to help these pets walk during the recovery period. The staff at Blue Springs Animal Rehabilitation Center would be thrilled to discuss various options available.

Rehabilitation

A limb fracture will result in pain and dysfunction of the affected bone, as well as damage to the surrounding muscles, nerves and blood vessels are damaged. Discomfort and dysfunction of the limb may continue following fracture site stabilization due to damage of these supporting structures. Early limb use is usually encouraged to prevent decreased joint range of motion, muscle atrophy and bone density loss, however, activity must be strictly controlled to prevent undue stress on surgical implants and failure of healing at the fracture site. Rehabilitation during fracture healing involves the use of several modalities aimed at improving comfort and use of the affected limb while supporting safe bone healing. A common complication following fracture repairs is contracture – scarring of muscle groups with adhesions so the joints are unable to fully flex and extend. Contracture is most commonly seen affecting the quadriceps muscles following femoral fractures and is caused by prolonged immobilization. Advanced cases

of contracture carry a poor prognosis and commonly result in a non-functional limb due to an irreversible impairment of the joint range of motion. Early implementation of a formal rehabilitation program is crucial to prevent contracture.

The goals of rehabilitation are to control inflammation, maintain joint range of motion, decrease pain and strengthen muscle. A customized rehabilitation program may include:

Manual therapy

Stretching and massage increase blood flow to muscles and decrease joint stiffness. When pets are not ambulating normally, their muscles become tight and joint range of motion can become compromised. Controlled and appropriate stretching promotes increased flexibility and comfort during physical activity and decreases the risk of future injury. Massage alleviates discomfort through releasing endorphins and by increasing blood and lymphatic flow to affected areas. These techniques will result in decreased pain and inflammation post-operatively.

Aquatic Therapy

Aquatic therapy may include swimming and/or the underwater treadmill. The buoyancy provided by the water helps to limit the concussive impact on joints, allowing these pets to move more comfortably then on land. The increased resistance created by moving through water promotes increased muscle strength and cardiovascular endurance. The implementation of aquatic therapy in a senior management program can help to maintain an ideal body weight, improve joint range of motion, and increase muscle strength and tone. This will result in joint stabilization and increased overall comfort.

Physical modalities

A variety of physical modalities, such as cold laser therapy, may be utilized to reduce the severity of clinical signs and reliance on medications to control pain and discomfort. Laser therapy is the painless use of light energy to generate a photochemical response in damaged or dysfunctional tissue. This will, in turn, decrease pain and inflammation while accelerating healing. This modality is non-invasive, fast, comfortable and effective.

Cryotherapy/Heat therapy

Cold therapy can be used post-operatively to decrease inflammation. It can also be used after exercise to sooth sore joints and tissues. Heat therapy can be used prior to stretching and exercise to warm up the muscles and prevent injury.

Traumatic limb fractures are a common cause of lameness and can have significant long term effects on mobility and quality of life if appropriate measures are not taken early in the healing process. A customized physical rehabilitation program will ensure an optimal outcome and rapid return to function, allowing our furry friends to get back to doing what they love. For further information about how rehabilitation can help your pet, please contact Blue Springs Animal Rehabilitation Center.

www.bluespringsanimalrehabcenter.com