



## **Is an orthosis the right solution for you and your pet?**

OrthoPets offers both orthotic and prosthetic devices to help with your pet's unique case. But what is the difference between the two? Orthotic devices are used to help stabilize an injury or instability. Prosthetic devices are used to replace a partial limb segment and make up a limb length discrepancy for congenital defects or for partial subtotal amputation. Below you will find common orthopedic injuries and instabilities; as well as how a device may benefit your pet. All of our devices are designed to assist your pet pre-operatively, post-operatively or in lieu of surgery. Please reach out to one of our Case Managers for more information regarding our prosthetic devices and your pet's specific case.

### **Carpal and Tarsal Injuries**

Injury to the carpus (wrist) can be complex because it is composed of 3 joints, 6 carpal bones, 2 antebrachial bones (radius and ulna), and 4 or 5 metacarpal bones. There are multiple ligaments holding this structure together and injuries can occur at any of the joint levels (antebrachiocarpal, middle carpal, or carpometacarpal).

Injury to the tarsus (hock) can be complex because it is composed of 6 joints arranged in 3 levels, 6 tarsal bones, 2 antebrachial bones (tibia and fibula), and 4 (rarely 5) metacarpal bones. There are multiple ligaments holding this structure together and injuries can occur at any of the joint levels (tarsocrural, talocalcaneal, talocalcaneocentral, calcaneouartal, cetrodistal, and tarsometatarsal).

Clinical signs of carpal and tarsal injuries include lameness, swelling, and mal-alignment. Mal-alignment can include hyperextension and/or increased angling of the paw toward the midline (varus) or away from the midline (valgus). Minor injuries will resolve with rest and a temporary splint, however more severe injuries may require surgery or an orthosis. Additionally, any of the associated bones can be displaced (luxated) or fractured. Injuries to the Achilles complex is covered in another document. Common surgical approaches include repair of large ligament injuries when possible, screw fixation of fractures of the larger bones, partial or complete fusing of the carpus or tarsus so that it no longer bends (articulates).

Device design is paramount to success and depends on the type and severity of injury. Careful consideration is taken in prescribing a device and its specific components. Important clinical variables surround use of a paw segment and whether articulation by way of hinges is possible.

1. The paw segment is required in the following circumstances: short metacarpal or metatarsal bones, fracture of metacarpal or metatarsal bones, severe hyperextension, middle or distal joint hyperextension, subluxation, more than one plane of instability, excessive dewclaws, deranged digits, flexor tendon failure or shortening at the digits and wounds associated with the paw.
2. Articulation (hinging) is ideal whenever possible in order to provide as close to normal



limb use as possible. With this design, the carpus or tarsus can flex if appropriate and yet limit flexion or extension range of motion within safe parameters only; this is called an arthrodesis-on-demand. Articulation cannot be provided under the following circumstances: severe carpal or tarsal malalignment, bone tumors near the carpus or tarsus, metacarpal or metatarsal fractures, and non-reducible bone luxations. When articulation is not possible, patients may experience an altered gait in the device.

## Stifle Injuries

Injury to the cranial cruciate ligament (CCL, also called the ACL) is the most common orthopedic injury in the dog. This injury is due to a partial or complete tear of a ligament inside the stifle (knee). The resulting instability leads to pain and arthritis. There is no published study directly comparing use of a custom stifle orthosis to surgical stabilization for CCL injury in the dog.

Stabilization is recommended for best short and long-term function, quality of life, and comfort. Stabilization is traditionally done surgically either with a joint realignment surgery (TPLO or TTA) or with a pseudo-ligament surgically placed outside the joint (tight rope or lateral suture). These procedures are considered the standard of care. In the past 7 years, the use of a custom orthosis (brace) has become available as an alternative to surgery when surgery is not appropriate for any reason. These reasons may include other health issues, unacceptable surgical or anesthesia risk, advanced age, and financial constraints, among others.

**Even with an orthosis, surgery may be required.** When the cranial cruciate ligament is torn sometimes the meniscus is also torn. The middle or medial meniscus is most commonly injured and injury may occur at the time of the initial cranial cruciate injury or any time later due to too much activity on an unstable joint. A torn meniscus is very painful and if not treated it will cause continued lameness despite stabilizing the joint with surgery or an orthosis. If this occurs, a surgical procedure called a partial medial meniscectomy is required.

Because an orthosis is not the correct therapy for all patients, before choosing an orthosis the following points are important to keep in mind:

1. **The device MUST be put on and removed daily. The device is to be used all day every day**, but must be removed at night. The orthosis stabilizes the stifle, tarsus or carpus from the outside only when ON, while surgery does so from the inside. The device is not used at night and your dog must not be allowed to move about (jump on or off bed, wander the house, go outside through a dog door, etc.). Wearing schedules vary based on the type of injury.
2. **Adjustments are expected and are a normal part of the custom orthosis process.** The device is custom-made for your dog, and every effort is made to accurately fit the device. Two complimentary adjustments are included to help meet the requirements for an appropriate fit; your veterinarian will coordinate these adjustments. Increased activity and



activity intensity can expose fit issues requiring further adjustments. Please follow all instructions with on how to monitor your pet, contact OrthoPets as well as your veterinarian promptly if you have concerns. If adjustments are required, it will be necessary to ship the device to OrthoPets with a turnaround time of 1-3 business days excluding shipping time.

3. **Follow-up is critical to success.** An orthosis is considered a “durable medical device.” This means that proper use of the device is necessary to meet therapeutic goals and to ensure its safe application over the lifetime of your dog. In the first few months of fitting, your veterinary team, with the help of your OrthoPets case manager, will help coach you with regards to device use and rehabilitation. Annual to twice annual appointments are advised depending on age and activity of your dog. At these appointments, your doctor will thoroughly assess your dog’s orthopedic condition and evaluate the condition and fit of the device.
4. **The Role of Rehabilitation.** Most dogs adapt quickly to wearing an orthosis, however, behavioral techniques can facilitate this. Your dog will need to learn basic skills while wearing the device, which include: transitions (sitting, lying down, getting upstairs), and moving around on different types of surfaces (ground, carpet, hardwood floor, etc.). Orthopedic injury leads to compensatory abnormal movement and associated muscle strain and weakness. The best way to ensure the highest level of success is to follow recommended rehabilitation schedule and techniques. Each patient’s condition and abilities are unique and as such an individualized rehabilitation program is needed. Your veterinarian can help find a certified rehabilitation professional (CCRT or CCRP) in your area.
5. **A proactive approach to arthritis management is the second key to long-term success.** If the joint itself is injured rather than a ligament alone, osteoarthritis may develop. Steps taken early and continued throughout your dog’s lifetime will make a difference in terms of regaining and maintaining comfort and an active life-style well into the senior years. Consult with your doctors for a comprehensive pain management plan.