

Considerations for a Carpal Orthosis with a Turnbuckle Component



Diagnosis of a Brachial Plexus Avulsion or Radial Nerve Paralysis of the Forelimb

Patients that have been diagnosed with a Brachial Plexus Avulsion or Radial Nerve Paralysis commonly develop flexion contracture of the carpus and/or paw. This is caused by the loss of radial nerve function resulting in paralysis and atrophy of the extensors of the elbow, carpus and digits leaving the flexor tendons of the carpus and paw unopposed.

An orthosis is primarily used to restrict and possibly reduce further contracture of the carpus and paw from occurring while providing protection and preventing the patient from dragging the dorsum of the carpus and paw on the ground. Return of limb function cannot be not obtained directly through orthosis use. Rather, limb function is obtained through muscle innervation from nerve regeneration. The intent of the orthosis is to improve limb position through contracture release, protect the limb against wounds associated to dragging and provide an environment for the patient to establish nerve regeneration. Patients who regain triceps muscle function can become pathofunctional with the use of a carpus paw orthosis.

If you and your veterinarian have a goal of accommodating the limb's current presentation, we would likely recommend a non-articulating carpus paw orthosis to prevent further contracture and maintain the current angulation of the limb. For cases where the goal is to return the limb to its natural alignment, the addition of a turnbuckle mechanism to an articulating carpus paw orthosis may be recommended.

While we recommend our devices be accompanied by a formal rehabilitation program, it is critical for patients utilizing an articulating carpus paw orthosis equipped with a turnbuckle mechanism to undergo a formal rehabilitation program. Rehabilitation can address a myriad of patient presentations including the affected limb and the rest of the patient's body that is adversely affected due to compensatory changes. The prognosis for your pet would need to be discussed with your veterinarian. It is important to know your

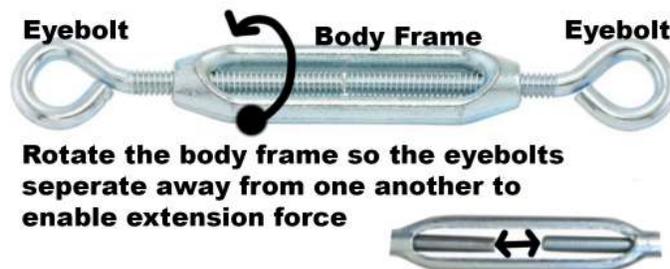
pet's gait will remain the same whether in or out of the orthosis unless the patient regains triceps function.

Is a Turnbuckle Appropriate for Your Pet?

Not every patient is a candidate for a turnbuckle mechanism. The turnbuckle is used to force extension millimeters at a time to assist in reducing the flexion contracture at the carpus and paw. Patients who are affected by a chronic Brachial Plexus Avulsion or Radial Nerve Paralysis are typically not candidates for a dynamic device solution. This is due to the musculotendinous structures of the flexors calcifying creating a permanent contraction. The use of a turnbuckle with these patients may cause further injury.

The turnbuckle should only be used under the supervision of a veterinary rehabilitation professional such as a Certified Canine Rehabilitation Therapist or Practitioner (CCRT/CCRP), and should only be used in conjunction with a formal rehabilitation program and regular stretching exercises as prescribed by your veterinarian.

How does it work?



The amount of increased extension should be discussed with your veterinarian. A turnbuckle consists of two threaded eyebolts threaded into the body frame. Rotating the body frame, which causes both eyebolts to be unscrewed out of the body frame simultaneously, makes adjusting the mechanism simple and measurable. Through the rotation of the body frame, the distance between eyebolt attachments increases thereby causing carpal extension.

The turnbuckle revolution schedule will be determined and prescribed by your veterinarian based on the flexion contracture quality and degree of significance. The patient's progress should be routinely monitored so the turnbuckle revolution schedule can be adjusted as needed. There are two ways to utilize the turnbuckle mechanism:



1. **Small Increments:** This is the most common turnbuckle revolution schedule. The turnbuckle can be adjusted in small increments.
 - A. $1/4$ - $1/2$ revolutions every 2-3 days.
 - B. If the extension seems uncomfortable for the patient or you observe muscle spasticity, you can de-rotate the body frame to decrease extension.
2. **Aggressive Increments:** This option should only be used if the patient has no tone and no muscle spasticity. The turnbuckle can be adjusted in large increments.
 - A. $1/2$ revolutions per day.
 - B. If the patient becomes uncomfortable and/or you observe muscle spasticity, de-rotate the device by a $1/2$ revolution.