

## INFRASPINATUS MUSCLE CONTRACTURE

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### **A Severely Stiff Shoulder** *“What structures are damaged in this disability?”*

The shoulder joint in dogs is made up of many structures; all of them assist in joint stability and ensure a wide range of motion for walking and running.

The infraspinatus muscle is one of these structures; it originates on the scapula (shoulder blade), tapers down to a tendon that inserts on the top of the humerus (point of the shoulder) and runs over the joint on the lateral (outside) surface. Its job, when contracting, is to help with flexion of the shoulder joint.

When a dog is running, he/she extends the shoulder fully and then contracts the infraspinatus muscle and other shoulder muscles to pull or flex the shoulder back and move the body forward. During very vigorous or long duration running, the infraspinatus muscle is very sensitive to “over doing it” and the muscle fibers get torn, stretched or otherwise damaged. This condition is commonly seen at the beginning of bird-hunting season and may be a classic example of the Weekend Warrior—poorly conditioned dogs with very eager personalities overdoing it!

### **It Begins with Pain** *“When this started it looked painful and now it doesn’t; why is that?”*

A common human athlete example similar to the original insult that occurs in dogs is a “hamstring pull”—a muscle gets torn during activity. When muscle fibers are damaged, the area becomes inflamed. This inflammation hurts; the area is warm, swollen and tender to the touch. Moving the muscle, usually in the stretch direction (shoulder extension), hurts as well. Dogs will hold the leg in a manner that limits extension of the shoulder; they may simply carry the leg off the ground and go on three legs, or they will dramatically shorten their stride resulting in a noticeable limp.

A significant thing about muscle healing is that it only heals by fibrosis (scar tissue formation); severely damaged muscle cells do not repair themselves. Over a 1-2 month period of healing after the original Weekend Warrior injury, the damaged muscle heals. First the pain goes away as the inflammation subsides; the dog may start using the leg more comfortably. But as the healing progresses, more and more scar tissue is formed in the muscle. Normal muscle is flexible and stretchy; scar tissue is not. As the scar tissue matures, it tightens and contracts and gets firmer. Now the dog transitions to a lameness that is persistent but appears like it is not painful. Some dogs will even have their foot up off the ground when they are sitting. This stage of the disability is related to scarring of the Infraspinatus muscle such that the shoulder joint can no longer extend like it should; it is permanently flexed but well healed and pain-free. Because of this, the leg is slightly shorter and the dog cannot extend the leg forward to walk or run normally.

**Releasing the Tension** *“Is it possible to make my dog’s leg work normally again?”*

The good news about this disability is that the damaged muscle is just one of several that do the work of supporting the shoulder joint and making the joint flex. Dogs can function well without it, so we use that to our advantage in recommending a surgical correction.

- Quite simply, the tendon of the Infraspinatus muscle is cut near where it connects to the humerus. Additional surrounding tissues are also released to gain full range of motion of the shoulder. This releases the tension on the scarred muscle; sometimes the release is quite dramatic resulting in a distinct “pop” as the joint is freed from restriction. This straightforward surgical maneuver immediately returns the shoulder joint to a full range of motion. After the small surgical site heals, the patients appear pain-free and fully functional without any enforced restrictions.

### **Common Concerns** *“Do I need to worry about anything after surgery?”*

As mentioned, the surgical procedure is quite straightforward and involves minimal tissue disruption; patients experience moderate post-surgical pain for a few days that is well managed with common pain-control techniques (medications, physical therapy, etc.) By two weeks post-operatively, patients appear quite comfortable at their surgical site.

One minor complication following this surgical procedure is an incisional seroma. This is a collection of fluid under the skin at the surgery site that results from joint fluid leakage or excess movement of the tissues in the surgical site. As mentioned, this is usually a very minor problem that will go away by itself, with perhaps some help in the form of warm compresses. Rarely, these fluid pockets get too big to reabsorb on their own, and they need to be drained with a needle. Seromas can be minimized with careful surgical technique and strict post-operative rest for four weeks.

After the surgery site is well healed, these dogs may return to their normal activity routines with no restrictions. Care should be taken to gradually condition these patients prior to any new and vigorous activities so that the opposite shoulder does not develop the same problem in the future.

### **Prevention is the Best Medicine** *“Is there anything I can do to prevent this from happening?”*

Any good athletic coach will recommend a thorough warm-up routine prior to athletic activities and a gradual conditioning over weeks to months before advancing to strenuous activities. The same holds for dog athletes. For seasonal activities, make sure your dog remains in condition during the off-season too.

Once the injury occurs, there are some steps to help minimize the damage caused by the muscle inflammation. When the lameness is noted, immediately restrict the dog's activity and have him/her evaluated by your

primary care veterinarian and/or veterinary surgeon. If the diagnosis of a muscle injury is made, recommendations may include:

- Referral to a veterinary physical therapist.
- Cold packs applied to the injury site 3-4 times daily.
- Anti-inflammatory medications.
- Anti-oxidant and anti-scar tissue supplements (such as Vitamin E).
- Stretching exercises after initial inflammation is reduced.

### **Summary**

Injury to the infraspinatus muscle is a relatively rare condition that is most commonly seen in highly athletic dogs, usually after vigorous activity such as bird hunting. It may be associated with lack of prior athletic conditioning. Prevention is achieved by keeping dogs in good athletic condition and warming them up to full activity gradually, just like the recommendations for human athletes. Once an injury to the muscle occurs, damage is minimized by treating muscle inflammation. Occasionally, muscle damage is bad enough to form scar tissue that limits extension of the shoulder joint (i.e. contracture). This condition is not painful, but can create a disability. Surgery for this contracture is relatively straight forward and very successful. Dogs can return to full activities after surgery and rarely experience long-term complications.