

## Aquatic Physiotherapy

With the great summer weather we are enjoying at the moment, I am often asked about swimming for dogs. In fact, aquatic physiotherapy is a lot more complicated than mere swimming, so I thought I'd take the opportunity in this, the second of our regular columns on animal physiotherapy, to teach you more about how we can use water to benefit our dogs' health.

### **Principles of Water**

Let's start by thinking about key principles of water, such as buoyancy, drag, pressure and temperature, and how they can impact upon the safety and effects of aquatic physiotherapy.

*Buoyancy* – The effect of water to relieve the effect of gravity can be useful, for example, when working with arthritic dogs. In these cases, buoyancy can help the dog exercise without the load he or she would experience through the joints on land because the deeper the water is, the more bodyweight is supported by buoyancy. Buoyancy can also be useful when working with neurologically impaired dogs, as the support given to the bodyweight can (if done correctly!) help prevent weak muscles from fatiguing as quickly as on land. Buoyancy can be very unhelpful, however, when working with dogs with cruciate ligament injuries or other injuries where we want to stimulate the body's stabilising muscles to help improve joint integrity. This is because research involving astronauts riding bikes in space versus cyclists riding on the ground shows that the stabilising muscles only work against gravity and when weight-bearing – too much buoyancy means gravity is eliminated and the dog is not weight-bearing – it is swimming instead. Therefore wading is much more beneficial for the stabilising muscles than swimming and we will discuss wading shortly.

*Drag* – The effect of water to resist movement can be useful, for example, when working with dogs with neurological problems, drag resistance can help improve the quality of their movements. However, drag can fatigue these same dogs' muscles more quickly than we would like, so a fine balance needs to be obtained! Another example of when drag can be useful is in strengthening programs for athletic dogs or dogs with orthopaedic injuries.

*Pressure* – Water exerts more pressure on the body than air and this can be useful to help reduce swelling, for example. The pressure of the water can also be useful when working with neurologically impaired dogs, as it gives “proprioceptive input” that helps improve body awareness and position sense. Water pressure can also be useful when working with patients who are in pain as the supportive feeling of the water can help reduce muscle spasm and promote relaxation.

*Temperature* – The use of warm water can also help to relieve muscle spasm and pain and therefore help the patient improve range of motion, for example, whilst in a more relaxed state than on land, however some conditions deteriorate when heated, so it is important to seek qualified advice about your dog's specific condition.

### **Swimming versus Wading**

I mentioned earlier that sometimes wading can be more beneficial than swimming. Let's consider in more detail the cases for each.

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*Swimming* – Swimming is great for improving cardiovascular fitness, so can be particularly useful when conditioning healthy athletic dogs. Careful staging of the swimming program is required to ensure scientific principles of exercise physiology are employed and the dog should be screened for pre-existing injuries that may have not been adequately rehabilitated, or musculoskeletal asymmetries that may pre-dispose to injury if not correctly managed.

Swimming targets the “prime mover” muscles that can develop to give the “Arnold Schwarzenegger” look which can be desirable in some sports and showing certain breeds (such as my beloved Rotties – I have four... I know: I’m crazy!). Good examples of prime movers are the quadriceps and hamstrings, which straighten and bend the stifle, respectively. Their job is to move joints from Point A to Point B – they’re not very good at supporting the joints like the “stabilising muscles” are.

The problem with the stabilising muscles, though, is that they tend to be tiny in comparison to the prime movers, and they also tend to be a little bit lazy. This means that the prime movers often have what we call a “mechanical advantage” over the stabilisers, so that the prime movers tend to work more and the stabilisers tend to work less, which can put the joints at risk of injury. It is therefore very important to target the stabilising muscles in any aquatic physiotherapy program, as teaching them when and how hard to contract has been proven to greatly reduce the risk of injury or re-injury in human experiments.

*Wading* – As I suggested earlier, wading is more beneficial for strengthening stabilising muscles as research shows that these muscles work best against gravity and under the load of body weight. When we wade in shallow water, gravity is stronger than buoyancy and the feet are still in contact with the ground and thus bearing some weight (although this varies depending on the depth of the water).

There are lots of ways we can get our dogs to wade, including: in the shallow end of pools (for taller dogs); in bathtubs (for small dogs); in dams, lakes or other sources of natural still water; or in high-tech underwater treadmills.

Underwater treadmills can sort of be described as high-tech hydrobaths with a treadmill in the floor and are great because they allow the therapist to vary the depth of the water and speed of the treadmill all with the touch of a button. They allow the dog to exercise in warm, clean water, however they are very expensive to install and run, which can make them financially unviable to run in climates like ours where we have access to so many other free sources of water to exercise our dogs in. For example, many of my clients’ dogs are familiar with their family pool or local river and find that their dogs enjoy doing physiotherapy exercises as part of their regular sessions in the water. Most people simply couldn’t afford the expense of several-times-weekly underwater treadmill sessions and many of my clients have commented that they prefer the convenience of a free source of water close to home.

## **Aquatic Physiotherapy Exercises**

So far in this article, I have concentrated on examples that strengthen muscles, but aquatic physiotherapy is about much more than just strength. I also briefly mentioned that water can be used to help reduce swelling and likewise it can also help improve range of motion, or flexibility. Some range of motion exercises can be performed actively by the dog whilst others require the

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assistance of a human, which can get a little messy if you're working with a large, shaggy dog in cold water!

Additionally, specific physiotherapy techniques known as mobilisations can be performed underwater to help improve a joint's function, or the physiotherapist may use a variety of aides, such as flotation devices or weights to help maximise the benefits of an aquatic physiotherapy session.

Aquatic physiotherapy exercise programs can be devised for most water-tolerant dogs, including those with neurological or orthopaedic injuries, arthritic or obese dogs, and athletic dogs. With such a wide variety of available exercises and treatable conditions, an individual program designed by a professional physiotherapist is obviously a wise idea.

To conclude, as I mentioned in my previous column, I will give you lots more examples of animal physiotherapy in upcoming columns, so if you have a question about how physiotherapy may be able to help your dog, or would like to suggest a topic for an upcoming column, please feel welcome to contact me on (02) 4739 4557 or [info@k9physio.com](mailto:info@k9physio.com).

Wishing your dogs the best of health, Helen Nicholson BPhy, MAnimSt(Animal Physiotherapy).

