



Introduction to Hydrotherapy in Veterinary Practice Mini Series

Session 2: Referral for Hydrotherapy

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What we need to know and why?



We must look at the bigger picture.

Hydrotherapy affects the whole patient. Although we may choose to target specific areas with our choice of treatment and exercises we cannot localise the effects of hydrotherapy to just one limb or area of injury. So we must consider previous medical history, past surgeries and injuries, current medical status, current level of fitness and ability to exercise.

When a patient is referred we need to know about the specific problem that the patient is being referred for – a referral or vet permission form just stating 'soft tissue injury' is really not sufficient! What soft tissue(s), where and when would be a good starting point!

Once all the information is gathered, from vets and physiotherapists, the hydrotherapist must consider if, in their opinion, hydrotherapy is an appropriate treatment for the patient being referred? Considerations will also include Their level of experience, vet professional/physiotherapist back up, treatment options at their hydrotherapy centre, size and breed of dog.

Importantly we should always consider are there less risky options available?

Prevention of harm – top of the list

If all members of the rehabilitation and care team do not fully understand the benefits, cautions and contraindications of hydrotherapy treatment there is a risk of

- Causing harm or distress for a patient
- Worsening an injury
- Delaying healing
- Causing permanent damage

Referral for hydrotherapy

- Diagnosis? – without a definite diagnosis it is difficult to give appropriate hydrotherapy treatment and there is potential for harm. For instance a dog referred for 'fore limb lameness' may be suffering from a soft tissue injury (acute or chronic?), elbow dysplasia, OCD, chronic arthritis or more seriously a cervical injury or condition. In at least two of the cases mentioned hydrotherapy could significantly worsen the condition. This is why hydrotherapists will frequently ask for clarification or further information.
- Date of injury or surgery (or surgeries) – we need to know how far we are along the path of healing, do we need to be extremely cautious or can we increase duration and intensity of exercise fairly quickly.



- What was the surgery? – A simple referral following 'cruciate repair' is not sufficient. Extracapsular or TPLO/TTA? Very different hydrotherapy protocols apply.
 - Who did the surgery?
 - In house? which vet surgeon – so the hydrotherapist knows who to liaise with
 - Referral specialist? The hydrotherapist will need copies of reports/discharge instructions. The hydrotherapist will normally contact the specialist direct.
- Medication – antibiotics, analgesia, NSAIDs, steroids, medication for other conditions that may affect ability to exercise or general demeanour.
 - Past medical history – very important so the hydrotherapist has a good idea of how the patient will react to water and exercise. For example heart condition, epilepsy, diabetes, Cushings/Addisons.
 - Past injuries or surgeries? For instance has the patient who is now being referred had a previous TPLO or hip replacement on the contralateral limb?
 - Do any other conditions or treatments planned at the practice affect hydrotherapy treatment? For example vaccinations, anaesthetic for xrays, chemotherapy?
 - Other treatments either by vets, physiotherapists or rehabilitation professionals.
 - Current exercise levels – vet surgeon recommendation versus actual!



Picture left acupuncture – vets usually prefer this not to be the same day as hydrotherapy. This then allows the effects of treatment to be evaluated.

Picture right functional rehabilitation - with Brutus who suffered a cervical subarachnoid cyst. Following surgery he was tetraplegic and required intensive inpatient rehabilitation with daily hydrotherapy. Functional rehabilitation can include gait retraining, learning to walk in a cart, using ramps and balance equipment, working with clients to learn how to use canine disability aids. Treatment can be planned for the same day, different days or with a day of rest before hydrotherapy depending on how demanding the work is and the patients reaction.

What else do we need to know?

- Behaviour – clients often forget to say their dog is muzzled at the vets!
- Relevant client information – needing reinforcement of dietary advice? Nervous or concerned about hydrotherapy (or cost of hydrotherapy).
- Agility, assistance dog or working dog? – the hydrotherapist will then have a better idea of the urgency or importance of rehabilitation/hydrotherapy
- Client will need help? – does the client have a disability or is elderly/frail and will need assistance with handling their dog?
- Financial considerations – is the client insured and what are the restrictions placed on hydrotherapy treatment by the insurance company?



Pictured above - Allen Parton, founder and Vice Chairman of Hounds for Heroes . Allen first attended hydrotherapy with his Canine Partners dog Endal who suffered from chronic arthritis in old age. Allen desperately wanted to be able to swim with Endal and realised his dream. When Endal retired EJ (Endal Junior) took over his duties and was one of the first dogs to be trained by Hounds for Heroes.

When to refer

- Depends on the condition – Fibrocartilagenous embolism (FCE) or ischemia urgent referral, degenerative myelopathy as soon as possible, conservative management IVD herniation no earlier than 8 weeks.
- Depends on surgery – for example ideally hydrotherapy would start at about 12-14 days post extracapsular repair or femoral head osteotomy. But for a TPLO/TTA/TTAR anything from 4 weeks to 10 weeks depending on the surgeons wishes, patient compliance and whether treatment in pool or water treadmill
- Other considerations – For example wound healing could be delayed by the wound getting wet during hydrotherapy treatment. Chemotherapy treatment will mean careful management of timings for hydrotherapy appointments between treatments and depend on the chemotherapy treatment being used.
- Consider pre op hydrotherapy when surgery is planned – for example prior to total hip replacement. Weight can be reduced, strength and muscle bulk increased and cardiovascular fitness can be improved. All factors that can help with the successful rehabilitation and best outcome for the patient post op.
- Nervous dogs/never swum and certain breeds – it is far better that a hydrotherapist is teaching a dog to swim BEFORE surgery! Dogs can be very unpredictable in their response to water and it may become clear that a few appointments may be necessary to settle the dog or that either pool or water treadmill treatment will be most appropriate for that particular patient. This is particularly important in the case of Dobermans, Great Danes, Greyhounds, Staffordshire Bull Terriers (they try too hard), some Border Collies, German Shepherds and nervous Golden Retrievers. Not all Labrador Retrievers and Newfoundlands are natural swimmers either! The ideal scenario is to make the dog comfortable and happy in the hydrotherapy centre surroundings and pleased/excited to meet the hydrotherapists. Returning after surgery is then a natural continuation of previous visits and rehabilitation is not delayed by any unforeseen problems.
- Nervous owners – we all know that dogs pick up on their owners concerns. One or two visits prior to planned surgery can help allay any fears and make the first visit post surgery much smoother without concerns about how to find the centre, parking, what will happen, etc.
- Overweight or very unfit dogs – refer as soon as possible. These patients will need to attend at least twice a week for hydrotherapy to be effective and it will take time to achieve results. If the patient is starting a weight control diet, hydrotherapy can help to achieve results more quickly than diet alone – success helps to improve client compliance.



Hydrotherapy contraindications

If hydrotherapy is contraindicated we mean that treatment is not advisable because the risk to the patient or others outweighs any possible benefit from hydrotherapy.

Inappropriate treatment may

- Risk making the patient's injury or condition worse
- Put the patient under physiological stress from other existing health /medical conditions
- Risk infection to other patients or staff

A current contraindication does not always preclude the possibility of hydrotherapy treatment at a later date.

Contraindications - HYDROTHERAPY POOL AND WATER TREADMILL

- Incontinence and/or diarrhoea
- Vomiting
- Suffering from contagious disease
- Open wounds
- Prior to fibrous seal formation for surgical wounds
- Surface infections



- External skeletal fixators – hydrotherapy is possible but needs serious consideration of risks and management of pin holes and wounds. When referring consider or ask about the experience/knowledge of hydrotherapists. Are they able to replace padding and vet wrap on the ESF and give good advice to owners. Would they recognise wound breakdown or signs of infection?

These patients must be prescribed antibiotic cover and all trained hydrotherapists will request this from the referring vet.



- Certain spinal conditions – cervical spondylomyelopathy conservative management, IVD disc herniation prior to 8 weeks if conservative management
 - Cardiac and respiratory dysfunctions – any condition which can potentially compromise the patient when asked to exercise or asked to exercise with the added problems of hydrostatic pressure when immersed in water
 - Any condition which compromises blood supply to peripheral areas – hydrostatic pressure can severely reduce blood and oxygen supply to tissues. Examples could be reduced cardiac output or traumatic damage to blood vessels.
 - Epilepsy – Sudden onset would preclude hydrotherapy until the underlying cause is found and/or the patient is stabilised on medication. Epilepsy in itself is NOT a contraindication but if there has been one or more fits in the week preceding hydrotherapy treatment will not be possible as the patient will be physically too exhausted and may suffer from muscle stiffness.

- Vestibular syndrome – any disturbance to the balance system can be very disorientating and often dogs with vestibular syndrome will be feeling nauseous. It would be completely unfair to place a dog in this condition in water and they will often fight to bring their head down into the water or try to lay over on their sides. However, once recovered sufficiently, hydrotherapy can be a very useful way of starting to stand and gently exercise to regain fitness and stability.

Contraindications specific to WATER TREADMILL

- Late stage degenerative myelopathy – these patients will be the ones who are not non ambulatory and too weak to take steps in the water treadmill. They can continue hydrotherapy in the hydrotherapy pool but treatment in a water treadmill has little or no value and offers no enjoyment or recreation. Swimming in the pool will be more useful in maintaining cardiovascular fitness and maintaining front end and core strength.
- Weak or weakening geriatric patients – water treadmill may be far too difficult and challenging for them.
- Severe weight bearing discomfort or disability – in the water treadmill these patients are still taking a good proportion of their weight and then being asked to walk against the resistance of water. Unless good gait can be achieved with lots of support (harnesses and many hands) water treadmill treatment may make them more painful and offer little if any rehabilitation potential.
- Severe weakness – as above
- Severe muscle atrophy – the patient may be too weak to move limbs through the water or there may be too much strain on other muscles or contralateral or diagonally opposite limbs. It may be more appropriate to build up muscle in the hydrotherapy pool and then progress to water treadmill later once the patient is strengthening and starting to add muscle.
- Non-weight bearing on a limb – impossible with forelimb NWB or amputation
- If use of treadmill heightens tone in neurological cases

Hydrotherapy precautions

A precaution or caution means that hydrotherapy can be considered but with ONLY with some or all of the following:

- Additional care – extra attention to the condition or handling of the patient. Possibly extra observations if there is concern regarding exercise tolerance.
- Additional hydrotherapists – the surgery or injury requires extra pairs of hands or additional equipment such as harnesses or stretchers.
- Careful planning – the patient and client may need help from hydrotherapists from car to hydrotherapy treatment and back. Or the patient may require additional drying and warming or management post hydrotherapy, for instance exfix management.

ALL of the precautions for a particular patient should be taken into account and the combination of two or more precautions may mean that hydrotherapy is not advisable or not advisable at that time. The hydrotherapists should always be considering the risks versus the benefits of treatment.



Brachycephalic breeds



Cushings disease



Hydrotherapy precautions – continued . . .

- Obesity – severe obesity affects exercise tolerance. These dogs initially need very gentle and undemanding hydrotherapy until they start to lose weight and cardiovascular fitness improves
- Breeds with elongated soft palate – difficulty in breathing and getting enough oxygen
- Brachycephalic breeds – must have their mouths open to get enough oxygen when exercising. Many will tend to close the mouth in water and can quickly become cyanosed when exercise is added to this scenario.
- Laryngeal paralysis and tie backs – at risk of aspiration of water. Need close observation and protection, must be prevented from biting at or swallowing water. No toys to be carried in mouth.
- Decreased exercise tolerance – if advised by vet on referral/permission form the hydrotherapists must know the reason for this. There could also be decreased exercise tolerance because of obesity and/or age.
- Cushings/Addisons disease – both diseases put the patient at risk. With Cushings the patient will fail to gain muscle and the heart muscle may also be affected, further compromising the dog.
- Diabetes – it is important that hydrotherapy appointments are at the same time the dog would normally be walked, so their strict management routine is maintained. Hydrotherapist should always be aware that the dog has diabetes and is at risk of collapse if it has not eaten or had medication – they should be aware that this is an urgent medical situation and the patient should be transported to the vet immediately.
- Epilepsy – the hydrotherapists should be aware the patient has epilepsy and know if fits are brought on by excitement, lights or usually happen during sleep. As long as the epilepsy is understood and well managed it is just a precaution to be aware of.
- Heart murmur – the hydrotherapists should be aware if there is a heart murmur and how significant this is for the patient. They should ask advice from the referring vet
- Renal failure – many geriatric dogs attending hydrotherapy have chronic renal failure but are well managed with diet. However hydrotherapists should be aware that this may affect the dog's ability to exercise and be observant/check with the owner about any deterioration in the dog's condition or increase in drinking.
- Spinal injury – all spinal injuries and conditions should be treated with caution for hydrotherapy. Detailed information is required from vets prior to considering placing any spinal injury patient in the water. Careful and experienced handling is required, including attention to maintaining a neutral spinal position in the pool or water treadmill. Additional hydrotherapists may be required to achieve this and also to protect airway if the dog is particularly weak or unable to easily maintain their head position. Hydrotherapists should pay attention to neurological signs and be particularly attentive to any increase in ataxia or increase in delay with knuckle tests.
- Undiagnosed forelimb lameness – when swimming dogs use their forelimbs to pull hard through the water. If the reason for forelimb lameness is undiagnosed there is a real risk of worsening the condition, particularly with soft tissue injuries.

A BIG CAUTION – no diagnosis and a history of shifting lameness between the forelimbs or lameness in both limbs may indicate a cervical spinal problem and there is a real risk of injury if the vet and hydrotherapists are unaware or have not considered this possibility.

- Extreme laxity of joints – hyperextension injuries in particular need careful management in the water to ensure that the action of bringing the limb through the water does not take the joint into hyperextension. In the pool the limbs and especially the carpus and tarsus tend to be held in flexion so hydrotherapy can be a very useful rehabilitation treatment.
- Soft tissue injuries? – it is important to consider what the injury is, when it happened and at what stage of healing. Starting hydrotherapy too early or inappropriate treatment could delay healing – useful information about ligament, tendon and muscle injuries follows below.
- History of exercise induced collapse – particularly in the case of Labrador Retrievers who suffer from a particular condition and are vulnerable if over exercised.
- Heatstroke/hot day – obviously no hydrotherapy if the dog has or is at risk of heat stroke! However in particularly hot weather clients should be asked if they have air conditioning in their car and hydrotherapists should provide shade and cool areas. Patients with degenerative myelopathy and geriatric patients are particularly vulnerable
- Difficulty in maintaining body heat – some spinal injury dogs have reduced ability to respond to changes in temperature and are vulnerable to an reduction in temperature. They may not be able to fully shiver or not be able to respond by increasing blood flow – they need to be kept warm and dried thoroughly. Also some dogs that are very thin or have little fat covering (greyhounds, whippets, etc.) also need additional care and fleece coats!

SOFT TISSUE INJURIES – useful revision regarding function and healing rates

Ligaments and tendons

LIGAMENT

- Links bone to bone across a joint
- Inelastic but flexible
- Becomes taught to prevent movement beyond the safe range for that joint
- Therefore protects the joint from damage

TENDON

- Attaches muscle to bone
- Inelastic
- When a muscle shortens it pulls the tendon, which pulls on the bone and creates a functional movement
- The tendon can stretch 5% to absorb sudden shock or muscle contraction – which can protect the muscle, tendon and the attachment point

Ligament injuries

Commonly known as a sprain

Often involves twisting of a joint leading to stretching or tearing of ligaments

Slow to heal due lack of vascularisation

1 year to reach 50-70% of it's normal tensile strength

Very painful during acute phase

Common ligament injuries/conditions

Cranial Cruciate Ligament – CrCL

Caudal Cruciate Ligament – CaCL

Medial and lateral collateral ligaments

Patellar ligament

Desmitis

Tendon injuries

Commonly known as a strain

Small strains are normal with strenuous exercise

Slow to heal due lack of vascularisation

6 weeks to reach 56% of normal tensile strength

1 year to reach 79% of normal tensile strength

More likely to tear a muscle or avulse a tendon attachment to bone under severe strain

Common tendon injuries/conditions

Biceps tendon

Achilles tendon

Tendinitis

Superficial digital flexor tendon

Muscle injuries

Also called a strain

The muscle has a good blood supply which aids healing

GRADE 1: Damage to less than 5% of the individual muscle fibres. Requires 2-3 weeks rest

GRADE 2: Damage to more than 5% of the muscle fibres but not a complete rupture. Rest period 3 to 6 weeks

GRADE 3: Complete rupture of a muscle – 3 months rest and may require surgery

All muscle strains should be rested and allowed to heal. If the patient continues to play, the condition will worsen. If ignored, a grade one strain has the potential to become a grade two strain or even a complete rupture.

Soft tissue healing - Stage 1

The inflammatory phase

72 hours

Oedema

Swelling, pain, redness and increased local temperature

Phagocytosis (removal of debris)

Soft tissue healing - Stage 2

Proliferation stage

48 hours to 6 weeks

Fibroblasts synthesise scar tissue

Collagen fibres are produced – but with random organisation

Soft tissue healing - Stage 3

Remodelling

3 weeks to 12 months

Cross linking and shortening of the collagen fibres promote a strong scar

Remodelling of collagen fibres to increase the functional capabilities of the soft tissue

Healing complications

Failure to rest – hydrotherapy should be started at the appropriate time for the injury

Inappropriate rehabilitation treatment – too much, too soon, or the wrong type of exercise can delay healing

Infection – hydrotherapists should be aware of and looking for any deterioration, heat, swelling or wound breakdown

Poor circulation – lack of nutrients or oxygen will delay healing. Hydrotherapy can help to increase circulation to the injury site

Medication – NSAIDs, steroids will affect laying down of muscle fibres or cause atrophy

Poor nutrition – everyone on the care team should be checking that the patients diet is good quality and appropriate

Challenging soft tissue – using hydrotherapy

Once in remodelling phase we can ask soft tissue to perform normal function – hydrotherapists should know which structures are involved and design an appropriate hydrotherapy protocol to work towards normal function. The water treadmill can be particularly useful in this respect.

Collagen will respond in response to challenge and hydrotherapy protocols and exercises can be designed to provide controlled challenges to increase healing and strengthening.

Hydrotherapy can help to improve functionality of soft tissue – either by allowing exercise earlier than possible on land or by providing more challenge than possible with just land based exercise.

Assessment prior to hydrotherapy treatment

Normally, and ideally, carried out by a veterinary physiotherapist in rehabilitation centres. Some hydrotherapists have additional veterinary rehabilitation qualifications and are able to carry out fairly detailed and useful assessments.

More junior hydrotherapists should still be able to carry out basic assessments and talk to clients to gain useful information about the patient.

A subjective assessment is about talking to the client to find out as much information as possible and will include:

Past history?

Injury/surgery – how did it go? Recovery as expected? Any infection?

Any changes since seen vet/referral

Symptoms / problems

Behavioural changes?

Aggravating factors

Easing factors

24hr pattern

Investigations

Previous/ concurrent treatment

Worsening/ improving/ static

Social History

Previous exercise
Current exercise
Exercise tolerance
Environment
Handling



Pictured above – best buddies.

On the left is Troy an Alaskan Malamute who had a congenital malformation which required a forelimb amputation at 6 months old. At 18 months he suffered an FCE and was tetraplegic. He recovered with daily hydrotherapy and lives a full life.

On the right is Wooster – 8 years old and suffering from hip dysplasia. From diagnosis at 6 months old his fitness, strength and mobility has been maintained using a combination of water treadmill and pool based hydrotherapy. Despite suffering some acute arthritic flare ups he has, so far, avoided hip replacement surgery.

Objective assessment:

To understand how the condition is affecting the patient – looking at movement, transitions (stand to sit, to lie and getting up) and areas of limitation.

Is their pain controlled?

Should the patient return to the referring vet for further analgesia? – without good analgesia it would be wrong and ineffective from a rehabilitation point of view to ask the patient to carry out hydrotherapy or exercise that may make them initially more uncomfortable.

Is the patient appropriate for treatment? – considering cautions, contraindications and behaviour.

To understand the client's wishes/aims – happy for the dog to be able to get up and potter round the garden, aiming for 2 hour walks or return to agility competition?

To establish a problem list

To allow treatment planning and goal setting



Gait assessment with physiotherapists



Some dogs take longer to assess than others!

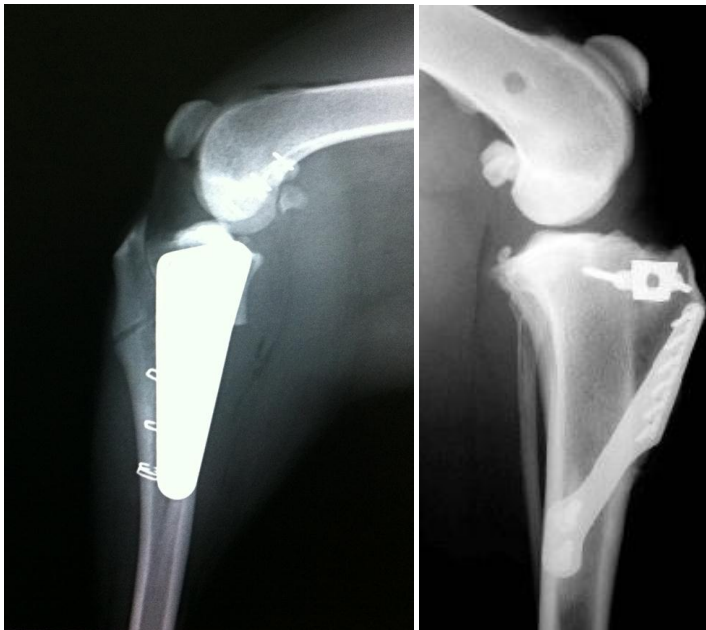
The Multi Disciplinary Team (MDT)

It is essential that all professionals involved in the patients care communicate with each other. This includes:

- First opinion and referral vets
- Physiotherapists
- Nurses – especially if running weight clinic
- Rehabilitation professionals
- Hydrotherapists

Reports and results from consultations/diagnostics need to be circulated to all members of the team

Case specific hydrotherapy programs



No two cruciate repairs are alike!

- Surgery differences – hydrotherapists need to know what was the repair and when? Hydrotherapy protocols and cautions vary greatly between surgeries.
- Patient differences – large breed, giant breed, easy to control, nightmare? Client compliance and ability/commitment to manage.

- Breed specific problems – some breeds heal more slowly and others are more difficult for hydrotherapy because of size or behaviour.
- Post op complications – hydrotherapists should be aware of the normal progression following typical surgeries and if progress is slow or there appears to be a deterioration should be confident enough to immediately refer back. Because hydrotherapists see a lot of similar cases they are very good at picking up the ones that do not appear to fit into the normal pattern and will send a patient back quickly and prevent further problems (for example meniscal tear or infection). The owner has no way of knowing that progress is not normal, unless they have previously had same surgery on same dog or other family dog.
- Duty of care to the patient? – all members of the team should have sharing information and achieving the best possible results for the patient and client as their priority.

Immediate or long term effects of hydrotherapy?

IMMEDIATE

Can happen as soon as the patient enters the water

Effects can be seen within the first hydrotherapy session?

LONG TERM

Will take a number of sessions for the effects to be noticed

Will most likely take at least four to six weeks

Can take up to three months

Carry over will increase over time

Immediate/short term effects of hydrotherapy include

- Decreased pain perception
- Increased sensory perception
- Relaxation of muscle tension and/or muscle spasm
- Decreased heart rate at rest
- Possible reduction in blood pressure
- Reduction of oedema
- Non weight bearing - easier to move
- Non weight bearing – less joint concussion
- Support for weakened or spinal injury dogs in neutral spinal position – increased core stability
- Increased proprioceptive input
- Increased active range of motion
- Patient may be more compliant
- Feeling of well being due to release of endorphins
- Reduction of frustration for dogs on cage rest or reduced exercise – less likely to be “uncontrollable” on land

Long term effects of hydrotherapy

- Increased joint range of movement – carry over of these improvements increases with repetition
- Increased muscle strength – depending on the challenges provided
- Improved muscle patterning and recruitment – always looking for quality of movement over quantity
- Prevention of secondary complications – avoiding muscle contracture, secondary muscle spasm and pain, fibrosis and permanent disability
- Improved cardiovascular fitness – depending on how hard the dog is worked
- Decreased pain and inflammation
- Potentially earlier return to normal function
- Slowing of progression of degenerative disease processes – particularly in the case of osteoarthritis.
- Improved quality of life – the most important benefit of all

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