Mission Statement

The aim of ***Animal Physiotherapy International*** is to provide a forum where we animal physiotherapists around the world can connect to share knowledge and information.

Contents

Letter from the Editor

Welcome to the inaugural edition of ***Animal Physiotherapy International***, the publication that strives to keep animal physiotherapists around the world connected. I would like to say a big thank you to all the contributors. I know you are all busy and we all appreciate the time you put in.

Remember, *anyone* can contribute. If you have news or an interesting case study that you think others would find valuable to reader, this is the forum for you to publish it. Please don't hesitate to send me any comments or suggestions on how this newsletter can be improved to be relevant and interesting to you, the reader.

Regards,

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WCPT News

By: Steven J. Strunk, PT
Chair, International Animal PT Organizing Committee

Attaining Subgroup status in the World Confederation for Physical Therapy (WCPT) for physical therapists working with animals has been an international topic of discussion for a number of years. The business meeting report of the Animal Physical Therapist Special Interest Group (APT SIG) at the Combined Sections Meeting of the American Physical Therapy Association in 2003 reveals then Vice President of the previously named APT SIG, David Levine, PhD, PT, OCS addressed this topic. He had investigated Animal PT becoming an International Subgroup under the WCPT and indicated that 6 nations with formally established animal rehabilitation groups, as recognized by their parent organizations, were needed in order to form a WCPT Subgroup. At that time only 5 nations, the United Kingdom, the Netherlands, the United States, South Africa, and Finland were known to have formally established Animal PT groups. Things have changed markedly since that time and will be explored further in this commentary.

The 'WCPT Articles of Association Related to Subgroups' define the criteria for qualification, rules and regulations, and other aspects necessary for application and admission for Subgroups. In brief, Subgroups shall: Have a specific interest and be organised to exchange scientific knowledge and to promote the advancement of physical therapy; Be composed of Member Organisations or groups recognized by their Member Organisation, and Members of the groups must also be members of the WCPT Member Organisation; Comprise at least 10 members representing at least 3 Regions, and; Be approved by the WCPT Executive Committee and have their status confirmed at

the next and each succeeding General Meeting. In addition, Subgroups must have a governing body composed of physical therapists only, and have a Constitution, Articles of Association, and Rules that are not in conflict with WCPT's Articles of Association. Currently existing International Subgroups in the WCPT include: Acupuncture; Orthopaedic Manipulative Therapy; Women's Health; Private Practice; Sports; Geriatrics; Educators in Physiotherapy; and just admitted at the 2007 General Meeting, Paediatrics.

A small contingent of PTs held an organizational meeting at the 4th International Symposium on Rehabilitation and Physical Therapy in Veterinary Medicine in the Netherlands, October, 2006. The purpose of this meeting was to further investigate the possibility of forming an International Animal PT Association that could qualify as a WCPT Subgroup. The first step was to identify and contact leaders of Animal PT groups from as many countries as possible to see if the minimum requirements could be met. At the time of the 2007 WCPT World Congress the confirmed list was as follows: Australia, Belgium, Canada, Finland, Ireland, the Netherlands, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States. These 12 countries are in 4 WCPT regions. In more recent developments, New Zealand is in the process of Animal PT group formation, and possibly Thailand will be forming a group as well. Thus, if all other requirements are met and every nation commits to the development of an International Association, the number of nations and regions to qualify as a Subgroup can be fulfilled.

The World Physical Therapy Congress of the WCPT in Vancouver, British Columbia, 2007 introduced a Networking Session for Animal PT. Many contacts were made there, including officers from some of the currently existing Subgroups. In combination with the helpful advice provided by officers of the WCPT, they have proven to be very valuable resources to help guide this project. Marilyn Moffat PT, DPT, PhD, CSCS, FAPTA, newly elected president of the WCPT at the Congress, has always been a strong advocate for physical therapists working with animals. She shared her support for the proposed International Subgroup. During Dr. Moffat's debate at the Congress she stated, "I have no difficulty when we use our exercise and physical and mechanical agents knowledge for the management of animals as long as one has the requisite animal knowledge to utilize our practice skills in that arena." In follow up she wrote that she, "will look forward to admitting your group in Amsterdam", during the WCPT General Meeting at the 2011 Congress.

Animal PT has come of age on a world stage with 4 International Symposia since the first in 1999, and the fifth one to be held in August, 2008. We now have the essentials to form an International Association for PTs with an interest in this specialization. The Keynote Address at the 2007 World Congress given by Martha Piper, BSc, MA, PhD included five personal qualities she identified for the profession: Hope; Nerve; Hard Work; A Strong Sense of Self, and; A Sense of Interconnectedness. Sandra Mercer Moore, BPhty, BA, DBA, outgoing president of the WCPT added a sixth quality, Passion. It is obvious physical therapists working with animals have the five qualities Dr. Piper recognized, as well as the sixth very important one mentioned by Dr. Mercer Moore. Now is the time to commit to these values, move Animal PT forward, and seize our moment in history!

A Pony Story

Author unknown

(I added this story as an example of what is possible with rehabilitation. We all need to try to challenge the traditionally accepted limits of animal rehab. Ed.)

Meet Molly. She's a gray speckled pony who was abandoned by her owners when hurricane Katrina hit southern Louisiana, USA . She spent weeks on her own before being rescued and taken to a farm for abandoned animals.
There she was attacked by a pit bull terrier, and almost died. Her gnawed right front leg

became infected and her vet went to Lousiana State University for help

.

Surgeon Rustin Moore met Molly. He saw how the pony was careful to lie down on different sides so she didn't seem to get sores, and how she allowed people to handle her. She protected her injured leg, constantly shifted her weight, and didn't overload her good leg. She was a smart pony with a serious survival ethic.

Moore agreed to remove her leg below the knee and a temporary artificial limb was built. Molly walked out of the clinic, to begin a new life.

"This was the right horse and the right owner," Moore insists. Molly happened to be a one-in-a-million patient. She's tough as nails, but sweet, and she was willing to cope with pain. She made it obvious the horse understood she was in trouble. The other important factor, according to Moore , is having a truly committed and compliant owner who is dedicated to providing the daily care required over the lifetime of the horse.

Molly's story turns into a parable for life in post-Katrina Louisiana . The little pony gained weight, her mane felt a comb. A human prosthesis designer built her a leg.

The prosthetic has given Molly a whole new life, Allison Barca DVM, Molly's regular vet, reports. And she asks for it! She will put her little limb out, and come to you and let you know that she wants you to put it on. Sometimes she wants you to take it off too."
And sometimes, Molly gets away from Alison. "It can be really bad when you can't catch a three-legged horse", she laughs.

Most important of all, Molly has a job now.
Kay, the rescue farm owner, started taking Molly to shelters, hospitals, nursing homes, rehabilitation centers, anywhere she thought people needed hope. Wherever Molly went, she showed people her courage. She inspired people and had a good time doing it.

This is Molly's most recent prosthesis. This photo shows the ground surface she stands on, which has a smiley face embossed in it. Wherever Molly goes, she leaves a smiley hoof print behind!

CASE STUDY: CERVICAL TRAUMA

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History: A one year old male wire-haired Dachshund was attacked by a larger dog eight (8) days before the first physiotherapy assessment. He had severe lacerations extending around the circumference of his neck. The most severe laceration extended across the dorsal aspect of his neck. The left third half of this laceration was the most severe, extending through all the soft tissues to the level of the cervical spine. The lacerations had been surgically repaired, including re-attachment of the torn muscle edges. At the time of the first physiotherapy assessment, some of the stitches at the left edge of the laceration had come out, and a second surgery was planned to repair this. The attending veterinarian also suspected subluxation of C5/C6 based on the radiographs of the dog's spine. The veterinary clinic staff had been applying LED therapy to the wounds on a daily basis.

Assessment: Severe spasm and pitting oedema of the dorsal cervical muscles. Dog was able to support the weight of his head in neutral, but had no active cervical extension. Fairly good active movement of the neck to the right (lateral flexion/rotation) but no active movement possible to the left. Palpable rotation of C5 and C6 spinous processes to the left. Paralysis of left front limb, with knuckling over of the paw and inability to weight bear. Postural reflexes (placing and protective extension) could not be elicited. Deep pain present, and biceps tendon reflex present but sluggish. Paresis of hind limbs with depressed reflexes. Dog not able to support himself in standing with hind legs.

Fig 1 Dorsal view of main cervical laceration following second repair

Anatomy of the cervical spine and the forelimb:

The dog has seven cervical vertebrae. The atlanto-occipital joint is a condyloid synovial joint, allowing flexion and extension of the skull. The atlanto-axial joint is a pivot joint, allowing rotation of C1 on C2 at the dens. There are also symphysis joints between the vertebral bodies of C1 and C2. The facets between the vertebrae from C1 to C7 are synovial plane joint. The orientation of the cervical facet joints are caudoventral/craniodorsal, allowing for flexion/extension and rotation. A combination of these planes of motion result in global cervical lateral flexion. There are eight (8) cervical nerve roots. The C6 to C8 nerve roots (as well as T1 and T2 nerve roots) supply the brachial plexus.

Table 1: Muscles on the dorsolateral aspect of the canine cervical

MUSCLE	ORIGIN	INSERTION	ACTION
Omotransversarius	Lower half of scapular spine	Wing of the atlas	Draws the limb forwards or the neck laterally
Brachiocephalicus	Distal third of the humerus	Occipital bone, mastoid process, median raphe	Draws limb forward or head and neck laterally
Sternocaphalicus	Manubrium of sternum	Mastoid part of temporal bone and nuchal crest	Draws head and neck to one side.
Splenius	T1-T3 spinous processes, entire median raphe of neck	Nuchal crest, mastoid process	Extension of head and neck
Spinalis	Lat aspect spinous processes L3-T6	Lat aspect spinous processes C2-C7	Extension and lat flexion of spine
Semispinalis capitis	T2-T4 transverse processes & C4-T1 articular processes	Caudal surface of skull ventrolat to occiput	Extension/ lat flexion of spine

(Pasquini et al 1995)

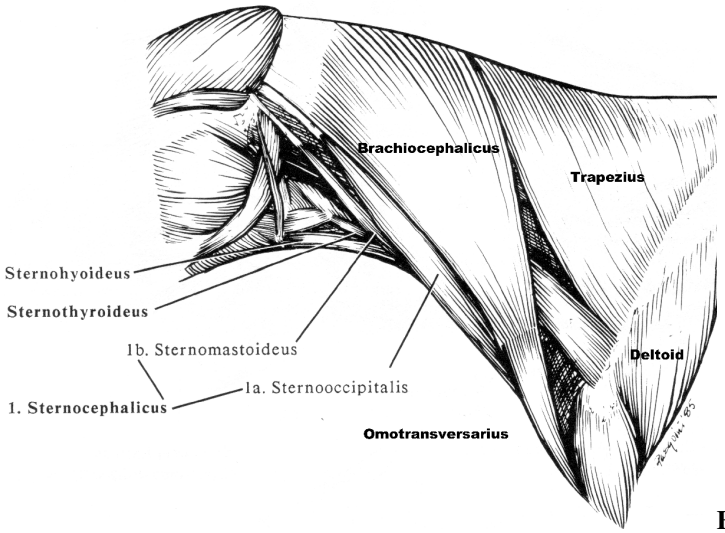

Fig 3: Superficial muscles of the canine cervical spine

(Pasquini et al 1995)

Table 2: Nerve root supply of pectoral limbs

NERVE	ROOT	MUSCLES
Radial nerve	C7, C8, T1, T2	Extensor muscles of elbow, carpus and digits. Supinator, Brachioradialis, Abductor pollicis longus, Extensor pollicis longus
Median nerve	C8, T1, T2	Pronator teres, Pronator quadratus, Flexor carpi radialis, Superf digital flexor, Radial head of digital flexor
Ulnar nerve	C8, T1, T2	Flexor carpi ulnaris, Ulnar heads of digital flexors, lumbricals, Interossei
Musculocutaneous nerve	C7 (C8)	Coracobrachialis, Biceps brachii, Brachialis
Axillary nerve	C7, (C6 & C8)	Teres major, Teres minor, Deltoid
Subscapular nerve	C6, C7	Subscapularis
Suprascapular nerve	C6, (C7)	Supraspinatus, Infraspinatus
Pectoral nerve	C7, C8	Superficial & deep pectoral muscles
Thoracodorsal nerve	C8, (C7 & T1)	Latissimus dorsi

(Pasquini et al 1995)

Clinical reasoning: This patient presented with two main problems. The first was the lack of cervical spine movement to the left and lack of cervical extension. This was primarily due to the transection of most of the major muscle groups that perform these actions. The second problem was the neurological signs seen in the left front limb and the hind limbs. The patient presented with a flaccid paralysis of the front limb, suggesting a lower motor neuron lesion involving all the nerve roots supplying the limb (C6 – T2). As the laceration on the left dorsal aspect of the cervical region was at the level of approximately C4/C5, these neuro signs were unlikely to be directly related to the laceration. Instead, the neuro signs seen in this patient correlate to a complete brachial plexus injury. The brachial plexus originates from the C6 to T2 nerve roots. A complete brachial plexus injury typically causes paralysis of triceps and distal limb muscles, and prevents postural reactions of the limb, preventing weight-bearing. The paw is usually knuckled over. This type of injury is normally due to a traction force on the nerve roots, such as would occur if the dog was shaken by the neck. If the traction on the nerve roots was severe enough, it could have caused damage to the ventrolateral spinal tracts. One would expect damage in this region to result in upper motor neuron signs in the pelvic limbs. However, if this damage resulted in a spinal shock reaction within these spinal tracts, it would result in a flaccid paralysis in the hind limbs.

Treatment: This patient was treated three times by the physiotherapist, and prescribed exercises were performed in between physiotherapy consultations by the vet clinic staff.

Session 1: Oedema massage of cervical region, deep massage of spasm in non-lacerated muscles. Gr 1 Left unilateral DV's (PA's) and Gr1 traction C5 – C7.Mobilisation of left scapula. Neural mobs Left radial, ulnar and median nerves distally (using paw). Approximations and rythmic stabilisations of left front.

Recommendations:

Encourage active movements of neck using food

Rythmic stabilisations of left front in sitting

After discussion it was decided to add Valium to the patient's medical treatment to reduce the spasm of the cervical muscles.

Session 2: Significant improvement was seen in cervical mobility and weight-bearing on the left front limb. Treatment was similar to the first session. Added to the treatment programme was weight-bearing weight displacement in sitting and standing using food, in order to improve balance. Lots of sensory stimulation was applied to all the regions of the dog's body, particularly the limbs, in each position that he was placed in.

Session 3: Second closure of the wound had been performed. Cervical mobility and alignment good. Improved scapular stability, and patient is able to get into standing position independently. However, the shoulder and carpal extensors were still too weak to protract the limb, and cranial weight displacement resulted in knuckling over of the left front limb.

The left front limb was splinted for the exercises to allow for better strengthening of the scapular, shoulder and elbow (proximal) muscles. To stimulate postural reflexes at the shoulder, the patient was lifted and tilted forwards and downwards, stimulating protective extension of the front limbs.

Discussion

This case highlights the incredible ability of the canine patient to recover function provided that appropriate stimulus is provided. A concern during treatments was that excessive active neck movement would be detrimental for soft tissue healing. A decision was made to give priority to cervical mobility and neurological rehabilitation, and it appears in this case as though early movement of the cervical spine was beneficial to soft tissue repair. However, the fragile state of repaired soft tissue should always be considered in any treatment programme, and mobilisation should be done within limits of the patient's pain.

The value of splinting in neurological rehabilitation is again highlighted in this case. The proprioceptive feedback gained from weight-bearing positions is a critical factor in the early stages of neuro-rehab. Postural reflexes, in particular protective extension is also a valuable tool to stimulate motor activity in a paralysed limb.

The role of the physiotherapist in multiple trauma cases in an important factor in determining rate of recovery and degree of function regained.

Equine Wobblers Syndrome

Laurie Edge-Hughes, BScPT, MAnimSt(Animal Physio), CAFCI, CCRT

Wobblers disease in horses is a very serious concern for equine owners. It is often a generic term used to describe the abnormal gait seen in these horses but also in horses with spinal cord disease from other etiologies. True wobblers disease is therefore better termed cervical vertebral malformation (CVM).

In cervical vertebral malformation lesions the neurological signs stem from progressive cervical spinal cord compression that is not the result of a single episode of contemporaneous trauma.[6] These lesions are classified as type 1 or type 2. Type 1 CVM occurs in younger animals from weaning until 2 years of age, with the underlying developmental vertebral changes most likely beginning the the formative first months of life (or in utero).[6]

Fig 1: Equine cervical vertebral malformation or CVM
(Picture from www.network.bestfriends.org

The following cervical vertebral changes may be present in part or in total:

Malformation with stenosis of the vertebral canal. This may be absolute, occurring with the neck in any position, or dynamic, occurring more on flexion (usually C2 – C6) or extension (C6 – T1).
Malformation with abnormal formation of and alterations to the articular processes. These degenerative changes include osteochondrosis.
Malformation with kyphosis and further canal narrowing on flexion (C2 – C6).
Further canal narrowing with extension (C5 – T1) of the neck.
Enlarged vertebral physeal growth regions that are equivalent to physitis in the long bones of rapidly growing young horses.
Caudal extension of the dorsal aspect of the vertebral arch over the cranial physis of the next caudal vertebral body. This is particularly associated with cases demonstrating dynamic stenosis with flexion between C2 and C5.
External trauma plays a variable role but may be the factor that initially precipitates the clinical syndrome.

Classification of Type 1 Cervical Vertebral Malformation in Horses.[6]

Type 2 cervical vertebral malformation tends to occur in older horses with severe osteoarthritic enlargement of cervical vertebral articular processes, with no evidence of developmental defects as with Type 1 CVM.[6] The vertebral bodies C6 to T1 are usually affected particularily during extension. External injury may be the most important factor in the genesis of Type 2 CVM.[6]

The signs of CVM include progressive ataxia of all 4 limbs, most notable in the pelvic limbs (or only in pelvic limbs in chronic cases).[7] There may be an acute exacerbation of the signs after an injury, but there is usually a slow onset of increasing clumsiness.[7] Localization of the lesions would require radiography or myelography, as neck pain is rarely seen in these cases.[7]

A variability of deficits can be seen depending upon the severity of the cervical vertebral malformation lesions. The grading system for the neurological deficits is as follows:

Grade and Classification of Neurological Deficits.[7]

Grade	Term	Definition
1	Subtle	Deficits just barely detected at normal gait, occur during backing, stopping, turning, swaying, neck extension, etc.
2	Mild	Detected at normal gait, exaggerated by above maneuvers.
3	Moderate	Prominent at normal gait, tend to buckle and fall with above techniques.
4	Severe	Tripping and falling spontaneously at normal gait to complete paralysis.

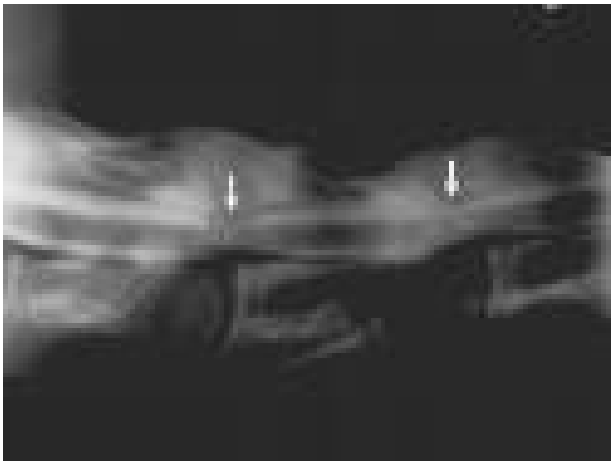

Fig 2: Radiograph showing two areas of cervical cord impingement
(Picture from www.syd.edu.au

Treatment

Treatment for cervical vertebral malformation in horses is possible; however prognosis following interventions can be variable. General approached include surgical, medical or conservative tactics.

The goals with medical intervention in cervical vertebral malformation are to reduce swelling and inflammation within the spinal cord.[1, 8] Phenylbutazone, corticosteroids and DMSO given intravenously have been recommended.[8] However, it is often expected that when the medical treatment is completed or removed, the animal will regress to its former state.[1, 8] Thus; this intervention would not provide the best prognosis for return to function and allowance of future performance ability of most affected animals.

Surgical treatments for cervical vertebral malformation endeavor to resolve the pressure on the spinal cord. Dynamic lesions (those where head and neck positioning worsen the clinical manifestations of the disease), are best treated with a surgical fusion which aims to stabilize the affected vertebral segment.[6, 8] Static lesions (a cervical static stenosis potentially caused by over-nutrition in the growing young horse) may require a dorsal laminectomy in order relieve cord compression.[8]
Surgery has been reported to improve the clinical signs and neurological deficit grading by 1 – 2 grades in 50% of cases.[6] Occasionally there is an improvement over 3 grades, and rarely an improvement of up to 4 grades.[6] Infrequently, a 'domino effect' can occur following fusion of two cervical vertebra whereby an adjacent vertebral segment develops a Type 1 CVM due to the added forces at that site.[6] The ability for surgical intervention in a moderately (grade 3) neurologic horse to result in a horse that is able to perform sporting activities is unlikely. With only an improvement of one grade, or at best two grades, the horse in this case would still present with subtle or mild (grade 1 or 2) neurological deficits and should not be ridden.[7]

A cervical vertebral malformation horse that is left alone or put on rest as a conservative form of management is not likely to improve.[6] In fact, on must question whether a 'wobbler' that recovers from a neurological deficit following this type of management can ever reach one hundred percent of its phenotypic potential.[6]

Dietary therapy has been described as being able to reverse the CVM disease process in thoroughbred foals (under 6 months of age) with management of nutrition and husbandry restrictions.[3, 6] Dietary management that restricted the crude protein and energy content of the feed consumed, yet provided 100% of the mineral requirements was utilized.[3] Feed analysis was conducted to enable calculation of protein content and adjustments were made to the diet at 3- to 4-month intervals, based on the rate of growth calculated from growth curves comparing treated and non-treated foals, the condition of the horse and the degree of improvement in the neurological signs or change in radiographic CVM score. As well, confinement (lack of turn out) was also undertaken to reduce the risk of dynamic compression of the spinal cord and to obtain total control over nutritional intake. Outcome was favorable in this treatment group with 9 out of 12 of the grade 3 affected horses being able to race upon maturity.[3]

The goals of physiotherapy in neurologic injuries are to re-establish the normal body and global kinetic patterns by means of active proprioceptor stimulation and suitable postural exercise.[9] In small animal spinal cord injuries, spontaneous recovery mechanisms can allow recovery of locomotion.[5] In some cases, it would be desirable to enhance the appropriate inherent responses with physiotherapy techniques so as to improve the degree of recovery.[5] Humans can show neural plasticity for months to years after an injury and functional improvement can continue to be made over this time .[5]

The main difference between human or small animal neurologic recovery and that of a horse is the degree of residual neurologic deficit that is deemed acceptable for overall functioning. The human and the small animal have

successful outcomes if activities of daily living can be performed independently and if the quality of life is still good. Physiotherapy may assist in attaining these goals. Acceptable standards in the horse are much higher, especially in the instance where the only acceptable outcome is for the animal to be ridden and for the progression to sporting performance level of activity. The addition of physiotherapy to veterinary interventions in the case of a CVM horse is unlikely to yield results that would enable a horse to become a sporting animal.

Alternate uses for neurologic horse are limited. An ataxic horse should not be ridden.[7] Any degree of ataxia would render a horse unsafe to ride even for recreational purposes. There is debate as to the heritability of CVM.[1, 4] Despite the conflict, it is reasonable to have concern regarding heredity. CVM may not be a simple recessive gene, as it is 3X more likely to affect males than females.[1] For this reason, horses with cervical vertebral malformation should not be bred or kept for stud purposes.[2]

It is useful for physical therapists engaged in animal rehabilitation to be aware of cervical vertebral malformations as a cause of neurologic signs and symptoms in horses. While treatment options do exist, none can guarantee a safe horse for riding or sporting purposes. It is probable that owners may contact animal rehabilitation therapists to seek alternate treatment options and second opinions on CVM cases, and it is important for the rehab professional to know the limits of recovery for these animals and for physiotherapy intervention strategies.

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