

# Cervical Vertebral Mobilisation Under Anaesthetic CVMUA: An Update

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**Abstract:** Physical therapies such as chiropractic, osteopathy and physiotherapy were recognised as playing a significant role in maintaining range of movement in articular joint complexes including those that form the spinal column. Advances in diagnostic imaging had led to the recognition of a significant incidence of joint pathology in the cervicospinal joint complexes of racing and sports horses. Along with these pathologies were associated loss's of range of movement of varying severities. Cervical vertebral mobilisation under anaesthetic, was a technique based on physiotherapy principles that was implemented to deal with more severe long term losses in range of movement of lower cervical and upper thoracic joint complexes. Since being introduced in 1994 modifications to this technique had been implemented to improve outcomes. The main improvement was in the range of movement acquired with a single treatment.

**Keywords:** Horse, cervical, spinal, range of movement, physical therapy.

## INTRODUCTION

Restoring and or maintaining range of movement (ROM) in vertebral joint complexes in sports and competition horses had been recognised as being an important issue for centuries. This more so by trainers and riders who saw a direct relationship between spinal ROM and a horse's ability to perform tasks required for in particular dressage and showjumping competition. They also recognised the horses neck as being a major contributor to this ROM. With dressage being introduced to the olympic games in 1912 this attribute gained even more attention. At the same time veterinary science was placing more significance on orthopaedic issues and their contribution to altered ROM and gait rather than the spine. In addition any early research into spinal issues was mostly directed at the thoracolumbar spine and sacroiliac articulations and not the cervical articulations [1,2]. The neck was usually only referenced in cases of cervical vertebral stenotic myelopathy [3] or vertebral fractures. Indeed even when 'back pain' was considered to be a clinical consideration this invariably only referred to the spine caudal to the first thoracic vertebra. In more recent times the cervical vertebral anatomy had received much more attention and this mostly due to the increased availability of CT. MRI [4], and ultrasound scanners and advances in digital radiography. Degenerative joint disease including disc pathology were some of the issues that were being detected and highlighted [5-9] using these imaging modalities. At the same time veterinarians had begun to explore physical therapies aimed at restoring ROM in cervical vertebral

joint complexes. This ROM was often reduced or lost in association with the pathologies that were being observed. Therapies were available through the fields of chiropractic [10,11] osteopathy [12] and physiotherapy [13,14]. There were also a considerable number of equine veterinary practitioners who took a more traditional approach to these issues and preferred to use intra-articular corticosteroid therapy [15].

The procedure cervical vertebral mobilisation under anaesthetic CVMUA [13] which originated from theories based in physiotherapy [13] was first published in 1994 however its development had begun in the early 1980's. It was introduced as a means of restoring longer term, more severe losses of cervicovertebral ROM where standing techniques were inadequate. As with any new procedure subtle alterations in technique were implemented in the years following its inception.

## MATERIALS AND METHOD

Since 1994 significant changes had been made to the CVMUA protocol. Initially there were nine separate mobilising movements demonstrated [13]. In the updated technique the movements which applied rotating forces to the joints were abandoned. Longitudinal extensions were still being utilised. Lateral movements were achieved with the addition of an assistant who gripped the headstall and then took the head in one of three directions. These were towards the hock, stifle or tuber coxae. The assistant would then apply tension in that direction to assist in stabilising the neck for the therapist [16]. In each of these positions the therapist would apply a downwards or compressive force which could be repeated at appropriate levels of the spine [16]. The horse would then be rolled over and the three movements repeated

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[16]. Rotation range was now achieved in conjunction with these lateral movements. The principle remained that enough force was applied to initiate movement in the restricted cervical joint complexes and then maintained until movement ceased. Another position was then adopted and treatment continued [13]. More time was usually allocated to areas of more severe stiffness or loss of ROM. Advantage was also taken of the periods when the patient was exhaling as muscular tone was reduced at this time.

Mobilisation then consisted of three extension and three lateral movements. The lateral movements were repeated on left and right sides. After treatment the horses were stabled and NSAID's were administered for forty-eight hours. They were then rested in a half acre paddock for five days before ridden exercise resumed. Flexion training was encourage to assist in maintaining any newly acquired range. This adjunctive treatment (active passive motion therapy) had not been emphasised in the original article [13].

## RESULTS

The revisions to the original CVMUA technique had been largely implemented post 2000. Since then the major changes to outcomes were related to the amount of ROM that could be recovered in a single session. Previously it was normal practice to perform a second CVMUA at about eight weeks after the first [17]. A second was now only performed with cases where extreme stiffness and loss of ROM was evident. In these cases it was not possible to restore full or near full ROM in a single session.

In general sports horses were only treated once as newly acquired range was usually maintained with the aide of ongoing flexion training. Thoroughbred race horses were more likely to be seen on an annual basis as flexion training was not part of their regular training program and newly acquired range could be lost as a result of lack of use.

Originally anti inflammatory medication was avoided so as not to confuse positive outcomes with their use. It was later decided to administer non steroidal anti inflammatory agents NSAID's for the first forty-eight hours following treatment. This given that disrupting tissues by way of stretching and compressing, that had not moved through affected range for some considerable time, was in itself thought to induce a degree of inflammation. Medication then eliminated any stiffness or lameness that had occasionally been reported in the first forty-eight hours following CVMUA [17].

## DISCUSSION

Active, passive and active assistive motion therapies [18-20] had in recent times replaced the notion that immobility and rest were the keys to physical recovery following traumatic events including post operatively. The recognition of the role of movement in the healing process and the importance of maintaining normal free range of movement of tissues and joints had ostensibly turned these theories on their head. Active motion therapy, of which one form was early ambulation following traumatic events including surgical procedures, had now become the norm. Passive motion therapies were normally applied by a trained physical therapist with the aim of restoring and maintain free range of movement in affected structures or tissues. A horse performing flexion exercises under the direction of it's rider was a form of active assistive motion therapy. CVMUA was a form of passive motion therapy as there was no involvement of the patient.

More recently, degenerative changes in the cervical and cervicothoracic joint complexes had been recognised [5-9]. An association between inherent ROM [21] and the incidence of certain pathologies had also become apparent [22]. The logic to this lay in the fact that joints with greater ROM were more likely to encounter more extreme pressures if challenged whilst at the limits of range. For example, the difference between falling forward and being supported by a straight wrist or one that was bent at right angles.

The best environment for healing and to also limit further degradation of joint structures was one in which the joint complexes were capable of full pain free range of movement. To restore cervicospinal ROM in a 500 kilogram animal that had lost 60-80% of its inherent range was a challenge to any therapist. When the same horse was experiencing pain at the limits of available range and was becoming hyper responsive to touch and pressure that task became even more difficult. Anaesthesia then provided an environment in which improvements in range could be realistically and safely acquired [14].

Unfortunately the main barriers to the adoption of this technique by veterinarians had firstly been concerns over possible adverse reactions to anaesthesia and the possibility a horse could be injured during recovery. In 40 years of performing CVMUA's the author had only once had a horse injure itself during recovery and had never had any serious adverse reactions to anaesthesia. Given both the

excitable and sensitive states in which many of these horses presented, it seemed more likely that operator or patient trauma would be encountered as a consequence of attempting to treat the conscious animal.

The second factor was the degree of physicality involved in performing a CVMUA and in particular when treating some of the larger breeds. This was a practical consideration.

These issues should not however be barriers to veterinarians providing the most appropriate form of treatment and thence best quality of life for their patients.

## REFERENCES

- [1] Jeffcott LB. Disorders of the thoracolumbar spine of the horse: A survey of 443 horses. *Equine Vet J* 1980; 12(4): 197-210. <https://doi.org/10.1111/j.2042-3306.1980.tb03427.x>
- [2] Townsend HGG, Leach DH, Doige and Kirkaldy-Willis WH. Relationship between spinal biomechanics and pathological changes in the equine thoracolumbar spine. *Equine Vet J* 1986; 18(2): 107-112. <https://doi.org/10.1111/j.2042-3306.1986.tb03559.x>
- [3] Yovich JV, LeCouteur RA, Gould DH. chronic cervical compressive myelopathy in horses: clinical correlations with spinal cord alterations. *Aust Vet J* 1991; 68(10): 326-334. <https://doi.org/10.1111/j.1751-0813.1991.tb03091.x>
- [4] Sleutjens J, Cooley J, Sampson S, Wijnberg I, Back W, van der Kolk J, Swiderski C. The Equine Cervical Spine: Comparing MRI and Contrast-Enhanced CT Images with Anatomic Slices in the Sagittal, Dorsal and Transverse Plane. *Eq Vet J* 2014; 46: 74-84. [https://doi.org/10.1111/evj.12267\\_146](https://doi.org/10.1111/evj.12267_146)
- [5] Rombach N. The structural basis of equine neck pain [dissertation]. Michigan State University 2013; pp. 136-154. [https://d.lib.msu.edu/etd2978/datastream/0BJdownloadThe\\_structural\\_basis\\_of\\_equine\\_neck\\_pain.pdf](https://d.lib.msu.edu/etd2978/datastream/0BJdownloadThe_structural_basis_of_equine_neck_pain.pdf)
- [6] Bergmann W, Bergknot N, Veraa S, Gröne A, Vernooij H, Wijnberg ID, Back W, Grinwis GCM. Intervertebral Disc Degeneration in Warmblood Horses: Morphology, Grading, and Distribution of Lesions. *Vet Pathol* 2018; 55(3): 442-452. <https://doi.org/10.1177/0300985817747950>
- [7] Dyson S, Busoni V, Salciccia A. Intervertebral disc disease of the cervical and cranial thoracic vertebrae in equidae: eight cases. *Equine Vet Edu* 2019. <https://doi.org/10.1111/eve.13125>
- [8] Veraa S, Bergmann W, Wijnberg ID, Back W, Vernooij H, Nielen M, van den Belt AM. Equine cervical intervertebral disc degeneration is associated with location and MRI features. *Veterinary Radiology and Ultrasound* 2019; 60(6): 696-706. <https://doi.org/10.1111/vru.12794>
- [9] Haussler KK, Pool RR, Clayton HM. Characterization of bony changes localized to the cervical articular processes in a mixed population of horses. *Plos One* 2019; 14(9): 1-27. <https://doi.org/10.1371/journal.pone.0222989>
- [10] Haussler KK. Review of manual therapy techniques in equine practice. *Equine Vet Sci* 2009; 29(12): 849-869. <https://doi.org/10.1016/j.jevs.2009.10.018>
- [11] Haussler K. Joint Mobilization of the Cervical Region. In *Proc. AAEP 360 Pain in the Neck* (Fort Collins, CO) 2016; 24-26.
- [12] Colles CM, Nevin A, Brooks J. The osteopathic treatment of somatic dysfunction causing gait abnormality in 51 horses. *Equine Vet J* 2014; 26(3): 148-155. <https://doi.org/10.1111/eve.12122>
- [13] Ahern TJ. Cervical vertebral mobilisation under anaesthetic (CVMUA) a physical therapy for the treatment of cervicospinal pain and stiffness. *J Equine Vet Sci* 1994; 14(10): 540-545. [https://doi.org/10.1016/S0737-0806\(06\)81638-2](https://doi.org/10.1016/S0737-0806(06)81638-2)
- [14] Ahern T. Physiotherapy for animals. In: *Maitland's Vertebral Manipulation*. Melbourne: Butterworth Heinemann 2001; pp. 428-33.
- [15] Riccio B, Frascchetto C, Villanueva J, Cantatore F, Bertuglia A. Two Multicenter Surveys on Equine Back-Pain 10 Years a Part. *Front Vet Sci* 2018; 5: 195. <https://doi.org/10.3389/fvets.2018.00195>
- [16] Dr Tom Ahern, Equine veterinarian and researcher. Horse neck mobilisation. 2005. [http://www.drtoahern.com/Dr\\_Tom\\_Ahern.com/Videos.html](http://www.drtoahern.com/Dr_Tom_Ahern.com/Videos.html)
- [17] Ahern TJ. Laminar corial hyperaesthesia in chronic forelimb lameness. *J Equine Vet Sci* 1995; 15(11): 460-463. [https://doi.org/10.1016/S0737-0806\(06\)81811-3](https://doi.org/10.1016/S0737-0806(06)81811-3)
- [18] Salter RB, Simmonds DF, Malcolm BW, Rumble EJ, MacMichael D, Clements MD. The biological effect of continuous passive motion on the healing of full-thickness defects in articular cartilage. *J Bone Joint Surg* 1980; 62(8): 1232-51. <https://doi.org/10.2106/00004623-198062080-00002>
- [19] Salter RB. The biological concept of continuous passive motion of synovial joints. The first 18 years of basic research and its clinical application. *Clin Orthop Relat Res* 1989; 242: 12-25. <https://doi.org/10.1097/00003086-198905000-00003>
- [20] Vanwanseelef B, Lucchinetti E, Stüssi E. The effects of immobilization on the characteristics of articular cartilage: current concepts and future directions. *Osteoarthritis and Cartilage* 2002; 10(5): 408-419. <https://doi.org/10.1053/joca.2002.0529>
- [21] Clayton HM, Kaiser LJ, Lavagnino M, Stubbs NC. Dynamic mobilisations in cervical flexion: Effects on intervertebral angulations. *Equine Vet J Suppl* 2010; 38: 688-94. <https://doi.org/10.1111/j.2042-3306.2010.00196.x>
- [22] Veraa S, Bergmann W, Wijnberg ID, Back W, Vernooij H, Nielen M, van den Belt AM. Equine cervical intervertebral disc degeneration is associated with location and MRI features. *Veterinary Radiology and Ultrasound* 2019; 60(6): 696-706. <https://doi.org/10.1111/vru.12794>

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