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# Four Front

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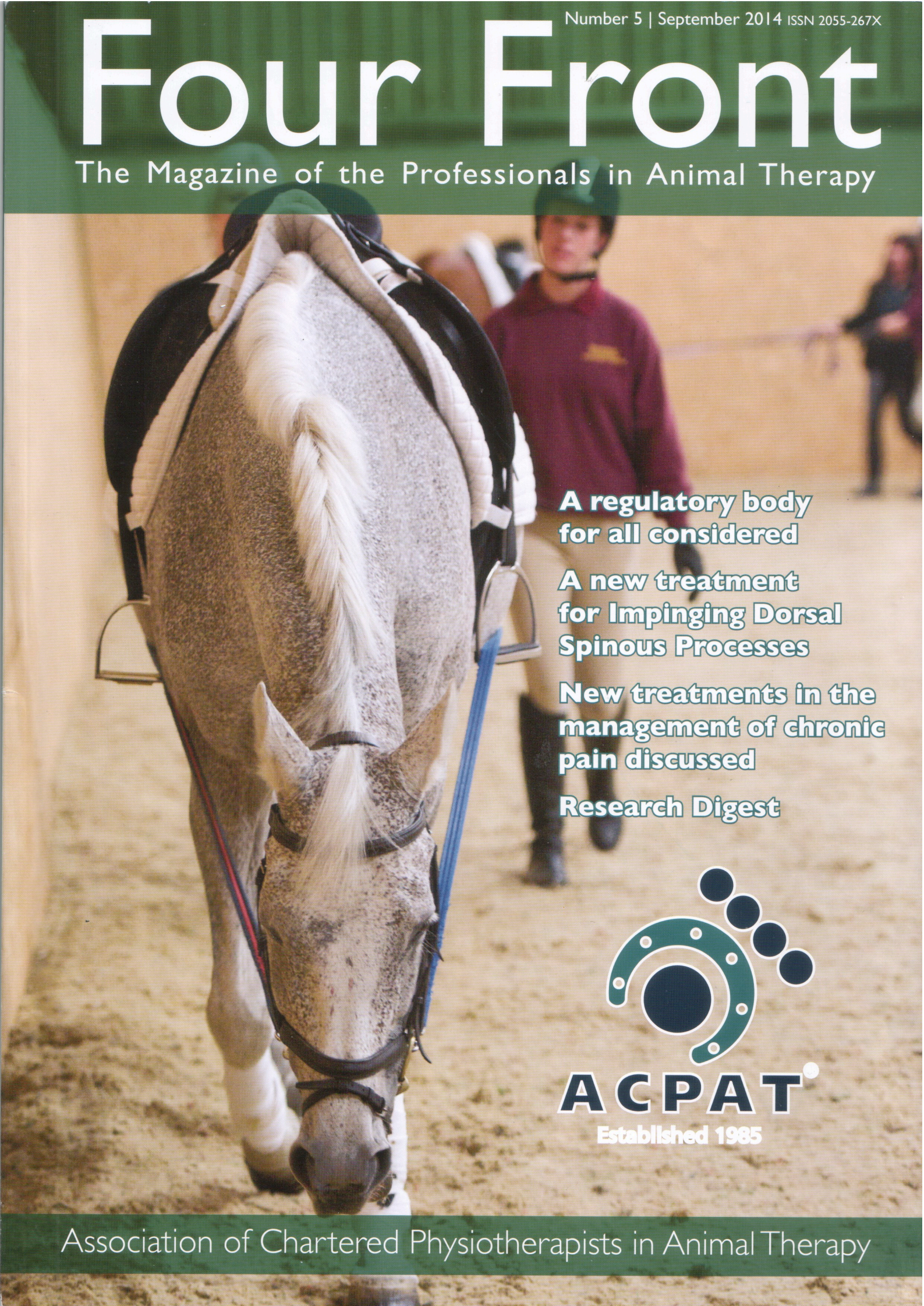

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# Consideration into the effects of the noseband as part of a physiotherapy assessment

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Physiotherapy is an important aspect of maintaining the horses well being. One aspect of the role of the Physiotherapist is in assessing and treating pain and performance issues relating to the tack the horse wears. Whilst poor saddle fit has long been of concern, this article puts forward the case for greater emphasis being placed on the effect of the bridle, in particular the noseband.

## No jaw, no horse?

There has been increasing controversy in the equestrian world over the past few months about nosebands, and how tight they should or shouldn't be. The International Society for Equitation Science (ISES) has recommended a taper gauge to be used at all competitions to ensure that the amount of space under the noseband allows a horse to express certain behaviours that are potentially restricted through over tightening (International Society of Equitation Science Position Statement on Restrictive Nosebands).

For an animal that chews approximately 30, 000 times per day (Mayes and Duncan, 1986), good temporomandibular joint (TMJ) movement is vital. TMJ movement is controlled by the mandibular nerve which supplies the muscles of mastication including the temporalis, masseter and pterygoid muscles. The sensory innervation of the face is provided by the trigeminal nerve, and in human studies the TMJ joint disk has been shown to be richly innervated with sensory nerves (Asaki, et al., 2006). Restriction of TMJ movement, or muscular tension and pain in this area, can lead to difficulties in chewing, ridden problems and behavioural issues.

## Why does the horse need TMJ freedom during exercise?

In humans, clenching the TMJ creates a concurrent activation potentiation leading to simultaneous activation of remote muscles and increased activation of the H-reflex (Ebben, et al., 2006). A horse resisting against a tight noseband would be likely to contract the muscles activating the temporomandibular joint, potentially leading to a concurrent activation potentiation and therefore increasing muscular resistance throughout the cervical spine and potentially the body.

*To breathe properly*

The Animal Welfare Act 2006 states that the animal needs "to be able to exhibit normal behaviour patterns". The horse is an obligate nose breather – they can only breathe through their nostrils, not their mouth (Dyce, et al,. 2002). As for human athletes, sufficient oxygenation of the muscles is essential for their optimal performance during exercise, so it is extremely important that the horse's air supply is not restricted during exercise. If the horses' airways are restricted, as is potentially the case with a drop noseband or ill fitting noseband, the horse can only display discomfort through behaviour changes, perhaps by throwing their head in the air, or not working willingly for as long as you might expect.

*To show us when they are in pain*

Horses are non-verbal animals, and communicate with their rider or handler through their behaviour. Some of those behaviours, particularly in the ridden horse, include opening the mouth, sticking out the tongue or by crossing the jaw. We should remember that the behaviour has a root cause, and stopping the horse from demonstrating the behaviour by strapping his TMJ tightly shut does not address the underlying problem. There is then the potential that the horse will choose a different behaviour in an attempt to communicate with the rider, such as rearing or refusing to go forwards. World Horse Welfare says "Restrictive nosebands should not be used in such a way that it causes the horse pain or discomfort as apart from the fact it would be wrong to do so this it will only make matters worse when dealing with a horse that is having issues with acceptance of the bit" (Fordham, 2014).

*Dentistry*

As a prey animal, horses are inclined to mask pain (Hall, et al., 2013) and problems such as dental pain can distract the horse from it's work and affect performance (Johnson and Porter, 2006). Therefore, it is extremely important for equine welfare and performance that pain is identified as early as possible. Allowing the horse freedom to move it's TMJ during exercise means that the rider can detect pain behaviours.

When a horse raises or lowers its head, the TMJ naturally moves slightly. Dental problems can limit this movement. If a rider asks a horse with an undiagnosed dental problem to change it's head position or carriage during the course of its

work, the horse may be unable to do so, or find such a movement very painful. The horse may try to oblige the rider by instead opening it's jaw, which could allow the mouth to move in the way described despite the dental problems. A tight noseband may prevent the horse from doing this. This can, in turn, lead to performance problems (Johnson and Porter, 2006).

Tooth grinding and attempts to avoid the bit can also both be indicators of pain (Hall, et al., 2013), and excessive bit pressure can damage the bars and cheeks (Johnson and Porter, 2006). These can all be hidden by a tight noseband. A tight noseband can also sensitise the mouth (McLean and McGreevy, 2010; Randle and McGreevy, 2011) and can press the inner surface of the cheeks against any sharp edges on the teeth (McGreevy, et al., 2012).

*To show us that they are anxious*

Horses may also chew on the bit due to anxiety, nervousness or boredom (Johnson and Porter, 2006). Freedom to move the TMJ means that the rider can also detect these subtle signs from their horse and address these issues before they escalate into behavioural problems. A tight noseband is likely to be an additional stressor, rather than lead to relaxation of the TMJ (McLean and McGreevy, 2010). A stressed horse will be tense with restricted movement, and less able to perform their job to the best of their ability. Equestrianism is about the relationship of trust and respect between horse and rider, and masking your horse's freedom to display his emotions could damage that relationship.

*For effective training*

The working horse is generally trained using a system of 'pressure and release'. In other words pressure is applied (e.g. leg aids) until a certain response is obtained, at which point the pressure is released (e.g. the horse moves forward and the rider stops applying the leg aids). The same system is applied to the use of the reins and bit and forms the basis of the tiny, subtle rein and bit aids that the horse learns, which result in different responses. This type of learning (negative reinforcement) can be effective and humane when pressure is applied subtly and removed at the instant the horse responds. This is part of the basis of the widely held theory that a bit is only as gentle or harsh as the hands using it. An important aspect of effective horse training is the horse making this clear association between the behaviour and what happens as a result of it. An effective way of ensuring that this clear link is made is allowing the horse to feel an immediate comfort or relief from discomfort (McGreevy, 2007). An over-tight noseband will not allow the horse to escape the pressure in such a clear manner when the rider gives with their hands, thus undermining the skilled rider's use of the aids and of pressure and release. Failing to allow the horse to gain freedom from pressure when they offer the required response can create behavioural and performance problems and welfare is compromised by excessive tension (McGreevy, 2007).

An over-tight noseband is also likely to mask training issues. For example, a study has shown that shortening reins by 10cm causes shortening of stride, the head to be behind the vertical more often, increased weight on the horse's mouth and causes horses to open their mouths more often (Ludewig, et al., 2013). An over-tight noseband may mask a horse's response to overly short reins (e.g. mouth opening), and make it difficult to detect this as a cause for subsequent training issues. A horse that does not understand rein aids is likely to fight the bit; again, a tight noseband would mask this issue and mean the rider was unable to address the true cause of the ridden problems.

## The latest scientific evidence and recommendations

The FEI dressage rule book states that 'a cavesson nose band may never be as tightly fixed so as to harm the horse' (FEI, 2013). However, until recently there has been no objective, scientific way of assessing how tight a noseband needs to be before it causes harm.

Last year, the President of the International Society for Equitation Science (ISES) Professor Paul McGreevy published scientific data on noseband tightness that guided their subsequent position statement and recommendations (ISES, January and March 2012). Professor McGreevy and his colleagues used infrared thermography to measure the temperature of the horse's eyes and facial skin, as these measures correlate to the level of stress the horse is experiencing. The results show that tightening nosebands led to increased eye temperature and decreased skin temperature, indicating that horses were experiencing a stress response and also that the circulation to the facial skin had been affected (McGreevy, et al., 2012). The ISES recommends that 'the use of nosebands that constrict with potential to cause injuries should not be permitted in training or competition' (ISES, January and March 2012). The research group also found that while many equine texts state that a noseband should be fitted such that it is possible for an adult to insert two fingers under the noseband, this can be an inaccurate measure. The tightness varies depending on the size of the fingers and their position under the noseband. They developed a simple taper gauge device to solve this problem. This can be used to standardise this measurement, making it easier for judges to apply this measure across the board (McGreevy, et al., 2012). ISES recommends that all equestrian stewards use a device like this to check the tightness of nosebands, at the nasal midline (ISES, January and March 2012). Professor McGreevy says "Sadly, the practice of restricting jaw movement has become entrenched, as it prevents the horse from opening its mouth, which, in dressage, is regarded as a sign of resistance or lack of compliance and attracts

penalties for the rider. So, here is the paradox: rules that penalise evidence of rough riding (e.g., mouth opening) have prompted the development of gadgets that mask such evidence."

## What should you do if your horse moves their TMJ excessively during exercise?

The horse is a sensitive animal that uses subtle, non-verbal methods of communication. If your horse is moving his or her TMJ excessively during ridden work, there may be a reason for this. Scientist and equine sports massage therapist Hannah Mace says "To optimise our horses' performance we need to find the root cause of any issues. In this way we can solve the problem. Tight nosebands act more like a mask; covering the problem temporarily, but not allowing true improvement."

As with any 'problem behaviour' it is necessary to find out what the horse is trying to communicate in order to resolve the issue. Physiotherapists are in an ideal position to help the owner to address this. A detailed history, including questions regarding veterinary history, saddlery and dentistry checks, work levels, training, environment, and tack may reveal relevant information. Gait analysis, palpation and range of movement assessment are essential components in analysing the problem and determining appropriate management or treatment.

## References


Asaki, S., Sekikawa, M., Kim, Y.T., (2006) Sensory innervation of temporomandibular joint disk. Journal of Orthopaedic Surgery 14(1): 3-8.

Cook, W.R., (1999) Guardians of the Horse: Past, Present and Future Ed: Rossdale, P., Greet, T.R.C., Harris, P.A,, Green, R.E., and Hall, S. British Equine Veterinary Association and Romney Publications, 175–182.

Cook, W.R., (1999b). Pathophysiology of bit control in the horse. Journal of Equine Veterinary Science. 19(3):196–204.

Dyce, K.M., Sack, W.O., Wensing, C.J.G., (2002). Textbook of Veterinary Anatomy 3rd Edition. Saunders.

Ebben, W., Flannagan, E., Jensen, R., (2006). Jaw clenching results in concurrent activation potentiation during the countermovement jump. Journal of Strength and Conditioning Research, vol 22, 1850-1854.

Fédération Equestre Internationale dressage rules, (2011) 24th ed.

Fordham, A., (2014). Re: WHW's view on restrictive nosebands, email to Press Officer Amy Fordham (amyfordham@worldhorsewelfare.org) 5 October 2013

Hall, C., Huws, N., White, C., Taylor, E., Owen, H., McGreevy, P.,(2012). Assessment of ridden horse behaviour. Journal of Veterinary Behaviour: Clinical Applications and Research. 8(2):62–73.

International Society of Equitation Science, (2012) Position Statement on Restrictive Nosebands. http://www.equitationscience.com/restrictive-nosebands. Accessed 13th March 2014 International Society for Equitation Science. Position statements and recommendations – nosebands. Available at:http://www.equitationscience.com/announcements/news2?A=SearchResult&SearchID=767337&ObjectID=57622&ObjectType=7

International Society for Equitation Science, (March 2012) Newsletter 9:. Available at:http://www.equitationscience.com/documents/Newsletters/ISES_Newsletter_No9_March2012.pdf

Johnson, T.J., and Porter, C.M., (2006) Dental Conditions affecting the mature performance horse (5-15 Years). AAEP Focus meeting. Available at: http://www.vetequineteam.com/files/Patologias%20Dent%C3%A1rias%20em%20Cavalos%20de%20Performance.pdf

Ludewig, A, Gauly, M., König von Borstel, U., (2013). Effect of shortened reins on rein tension, stress and discomfort behavior in dressage horses. Journal of Veterinary Behavior: Clinical Applications and Research, 8(2), e15–e16.

Mayes, E., Duncan, P., (1986) Temporal patterns of feeding in free-ranging horses Behaviour 96: 105-129.

McGreevy, P. (2007) The advent of equitation science. The Veterinary Journal. 174: 492–500.

McGreevy, P., Warren-Smith, A., Guisard, Y., (2012) The effect of double bridles and jaw-clamping crank nosebands on temperature of eyes and facial skin of horses. Journal of Veterinary Behavior: Clinical Applications and Research 7(3):142–148.

McLean, A.N, and McGreevy, P.D., (2010) Horse training techniques which may defy the principals of learning theory and compromise welfare. Journal of Veterinary Behaviour. 5: 187–195.

Randle, H. and McGreevy, P., (2011) The effect of noseband tightness on rein tension in the ridden horse. International Equitation Science Conference, The Netherlands: Wageningen Academic Publishers. Available at: http://www.equitationscience.com/documents/Proceedings/Netherlands2011_Proceedings.pdf