

Equine Dentistry

Posture, Performance and Dentistry in the Equine Athlete

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Generously provided by Robyn Hood, of [IceFarm](#), and [TTEAM](#)

At a recent seminar organised by the International League for the Protection of Horses in New Market, England, a veterinarian highlighted the problems facing the modern horse, saying "specialisation has led to increased stereotypical training of greater intensity at a younger age".

It is no longer just the Thoroughbred youngsters that start their training from an early age. Warmbloods and other Sports Horses are being started earlier and earlier and under ever increasing pressure to perform bigger and better at a younger and younger age. Even horses destined for the pleasure market are started at three years of age. The training exercises are often repetitive. With twenty four teeth changing from the ages of one through to five the horse is going through significant changes in the mouth at the exact time when he is being asked to accept a bit, move in balance, and learn how to organise himself under saddle.

The majority of horse owners and care takers now readily accept that changes in the balance of the hoof can have a significant effect on the limbs and upper body of the horse. An imbalance in the hoof will be four times greater in the shoulder. It stands to reason that the same principle can be applied to the balance and comfort of the mouth. Retained caps and general dental changes can set up behavioural problems by causing discomfort, tension and imbalances through the still growing body of the young equine. Dental issues that arise or are overlooked as the horse matures can undermine the health and well-being of the horse by causing uneven stress on ligaments and joints, setting up tension patterns through the body that directly influence not only how the horse feels and performs, but how he learns, thinks and reacts.

Tension patterns can be present from birth and/or arise from negative influences on the body. They can be linked to specific behaviour problems and if not recognised and addressed can cause a great deal of anxiety for both the horse and its owner/carer. Behaviour and emotional and mental well-being are closely linked to a horse's physical state. These findings have been documented many times over primarily through the work of American horse trainer, Linda Tellington Jones. Each can affect the other for better or worse.

Changing undesirable posture to a more effective way of functioning not only relieves physical discomfort, but also encourages a less stressful and more successful existence. Whilst bad saddle and bit fit, inappropriate use of gadgets and

poor training techniques are obvious contributory factors to poor physical development, the mouth is generally a major factor in determining how the horse is able to perform. Tension patterns can be caused by and contribute to dental problems. Understanding and highlighting this inextricable relationship between the teeth and the posture can only serve to enhance the value of good equine dental care.

Causes and Effects of Oral Imbalances

Conformation, training, development, diet and management are all contributory factors to determining the health of the horse's mouth as well as its posture. The Traditional Chinese Medicine approach of the need for balance between all systems for optimum well-being is highly appropriate, for musculoskeletal injury can easily occur if any imbalance exists within the horse.

Many common behavioural problems such as head shaking, biting, rearing and napping can be linked to the problems within the oral cavity.

The mouth is linked to learning. When humans concentrate, they often chew pens, lips etc or maybe lick their lips. Babies place items in their mouths and recent studies on the learning process in children in Manchester, UK have concluded that children retain more information when they are chewing gum as they learn. The mouth is linked to the limbic system, the area of the brain that is considered to be the control centre for the emotions and the gateway to learning (Daniel Goleman, 1997). This apparent emotional connection is consistent with observations made by Linda Tellington Jones in her training system Tellington Touch Equine Awareness Method (TTEAM), of how many horses improve in their behaviour and the ability to operate in a calm and focused mode once tension in the mouth is reduced.

Working around the mouth, both inside and out also stimulates the salivary glands, which, in turn, trigger the relaxation-promoting parasympathetic nervous system. This quietsens the sympathetic nervous system, which triggers the "fight, flight or freeze" response. If dental imbalances are un-addressed, tension in the mouth will return. Horses that have oral discomfort will be more dry mouthed and therefore less relaxed both in day to day existence and under saddle.

The excessive use of hay nets, restricted turn out, and limited access to traditional pastures and/or hay can have an extremely detrimental effect on the teeth due to inhibited use of incisors, uneven wear of the molars and the overall impact a managed environment has upon the posture of the horse. In studies conducted in 1980 by Duncan in his study of the Camargue horse, wild equines were found to spend 60% of their day eating and 20% of their day standing. In the stabled horse with restricted access to hay and feed, only 15% of the day was spent eating and 65% of the time spent standing (Kiley-Worthington 1995). Ad lib hay for the stabled horse

enables him to maintain roughly the same time budgets as his more natural living counterparts. Although the horse with access to ad lib hay can spend 57% of his day eating with 23% of his day standing, his ability to move around whilst eating is generally restricted and this is further hampered by the use of hay nets.

When a horse eats from a hay net, he changes the way he organises his posture through the feeding process. The grazing horse or horses that are fed hay from the floor maintain a lower head and neck position whilst chewing. This enables the molars to occlude correctly. The body remains relatively straight and the horse will generally move around a little whilst it eats. Little or no excessive strain is placed on any one part of the body.

When eating from a hay net, the horse quickly settles to a habitual pattern of pulling hay from the net. The back will drop as the horse draws back with a mouthful of hay and the head and neck will often twist in the same way each time. The horse fed in this fashion will tend to chew each mouthful with its head and neck held higher. This posture can cause or exacerbate uneven muscle development and inappropriate wear of both the incisors and the molars. It is highly significant that the stabled horse, fed periodically throughout the day from a hay net, is more likely to develop postural, behavioural and dental problems than a horse kept in a more natural environment.

The Ridden Horse

Postural and dental issues are exacerbated once the horse is under saddle. Hooks, ramps, waves, wedges, buccal and lingual edges and other imbalances can determine whether the horse finds it comfortable to work in a true outline or not. A horse that is compromised through oral problems will not be able to move correctly and effortlessly. If ramps and hooks are present for example, movement in the mandible is restricted and the horse will simply not be able to lower his head to accept the bit.

Forcing the horse down through the rider's hands or through gadgets only serves to give a false illusion of collection and creates further discomfort for the horse throughout the body. Restriction of oxygen through the airways increases through over flexing at the poll causing stress and fatigue. Dental abnormalities can trigger evasive action and unwanted behaviour.

Buccal and lingual edges can cause a horse to move away from the discomfort and lean more on one rein than the other. The weight distribution through the limbs will be uneven and incorrect muscle development will quickly follow. Gait irregularities will occur and the horse may be described as being bridle lame. Tighter nosebands may be used to close the horse's mouth, as he will endeavour to find a way of working that is more comfortable. He may be described as evading the bit. Closing the mouth with equipment will also exacerbate the

stress placed on the horse physically and mentally. He may 'break' at the poll. In a short space of time his movement will become restricted and tension in the body will increase.

Rims, wedges, protuberant teeth etc will make it hard for the horse to flex correctly through the poll and neck. This pattern will persist through the body and the horse will find it difficult to work easily on both reins. Show jumpers for example, may struggle to take on a fence from a specific direction, or lose rhythm thus making related distances a problem.

Long Canine teeth can interfere with the bit action. They can result in tongue damage and may cause sudden and extreme pain giving rise to volatile, explosive behaviour. They can be responsible for a horse's reluctance to move forward freely from the leg and cause bridling and biting issues. He may hang on the bit and set through the neck or may develop a posture of working above the bit, hollowing his back and tipping his pelvis forward to compensate for the high headed posture.

High-headed horses are also highly strung and the horse with the raised head and dropped back is in the Flight posture i.e. in the posture that a horse adopts when it is alarmed. The heart rate and blood pressure increase and large muscles prepare for hasty action. Blood flow to the extremities – ears, lowers legs etc is reduced. If this posture becomes habitual a process of rehabilitation and corrective dental work will be necessary to release tension and enable the horse to function with a lower, more relaxed head carriage.

Wolf teeth, like Canines, can interfere with bit action and cause discomfort. They can make the horse heavy in the hand, or hypersensitive to aids. They can trigger bucking and rearing and general unwanted behaviour. Blind Wolf teeth can cause the same patterns of behaviour especially if the blind wolf tooth sits an inch or so in front of the molar as this allows the bit to sit between these two teeth.

Shear mouth as with all dental problems can set up huge changes throughout the body. The horse will generally find it difficult to work in a posture that is comfortable and may be sluggish or over reactive under saddle. It would be unrealistic to expect a horse with this abnormality to be able to work on any contact without careful adjustment and a realistic work programme.

Stepped and missing teeth can cause major problems for the horse both in hand and under saddle. They will determine how the horse accepts contact from the bit and which rein the horse favours. Horses that are difficult under saddle are also difficult in hand. Horses with dental imbalances generally present problems for their owner/care taker whether they are being ridden or not. As horses are handled around the head area, oral problems can easily result in handling difficulties. Comfort

levels influence tolerance levels and physical balance affects the horse on both the emotional and mental levels. Horses with oral problems can be dangerous to handle on a day to day basis. Simple float work will not be enough to remedy the situation.

It is important to recognise that the oral balance of a horse's mouth can be changed through poor rider posture, bad saddle and bit fit and incorrect training techniques. If problems persist or the horse plateaus in its rehabilitation process these other factors must be addressed. A rider that sits to one side or who is heavier with one hand can cause significant dental changes in the horse's mouth. A narrow fitting saddle will trigger the horse to drop its back when ridden bringing the head carriage higher. This posture will quickly become a habit and incorrect muscle development will occur. The postural changes will then further compromise the balance of the mouth.

Posture and Behaviour

For a horse to engage correctly, the neck must be lengthened and free. The forelimbs can then extend fully and the combination of muscle contraction from behind the scapula and the impulsion from the hind limbs enables the horse to move effortlessly forward. The abdominal muscles are engaged to elevate the back. A horse that is flexible and balanced through the body will be flexible and balanced in the mind. He will be easier to handle and show a marked willingness to work.

If any oral problems are present, this natural, rhythmic movement is lost. The horse becomes a machine. With unnatural wear and tear on joints, tendons and ligaments, it is unlikely that the horse will remain sound. He may be classed as sour, aggressive or flighty and will often find ridden work tiring and stressful. The degree to which the horse demonstrates his discomfort will vary depending not only on the amount of tension and pain he is carrying but also on his breed type and general personality. A horse with marked, reactive behaviour may not necessarily be in any more discomfort than the horse that merely swishes his tail or struggles to work on one rein.

Oral and physical examinations, tack and rug (blanket) fit checks must be carried out on a regular basis to ensure the maximum comfort of the horse. Intermittent lameness and gait irregularities are common problems linked to dental imbalances.

A horse that is working in a correct outline will be less prone to injury and will be generally healthier. Pain and stress can undermine the immune system. Traditional Chinese Medicine places great emphasis on the flexibility and health of the spine to ensure proper nerve function throughout the body. Many records exist to show the correlation between the spine and the internal structures and organs in humans. For example, C1 is linked to blood supply to the head, the pituitary gland, the scalp, bones of the face, the brain, both the inner and middle ear and

the sympathetic nervous system. C2 is linked to the eyes, the auditory nerve, mastoid bones, the tongue and forehead.

In studying the posture and behaviour of horses it would appear that the same principles might be applied to the equine. Horses with tension around the poll often exhibit behaviours that can be linked to the patterns described in the human texts. Horses with tension around the C1/C2 area are often hormonal in their behaviour, (there is a hormone acupressure check point in this area) spooky, noise sensitive, and unfocused with significant tension across the temporal muscles. This correlation between the parts of the body and the vertebrae continues through the length of the spine. Although horses have more vertebrae than humans it is likely that a similar pattern exists in the horse. In working with horses from the ground, significant changes are noted in behaviour and physical development as the horse learns to release his neck and lower his head. The changes remain and the horse, in a relatively short space of time, is calmer to handle and more consistent in behaviour and performance. A functional posture therefore has far reaching benefits, and appropriate dental care has an important part to play in determining the health of the horse on many levels.

Resistance to ridden work only comes from resistance. The majority of correctly trained equine dental technicians learn at the beginning of their studies to look for muscular imbalances in the horse's face as an indicator of dental problems. This imbalance in muscle development will not be confined to the head and face. The pattern will continue through the poll, neck, shoulders, back and hindquarters. Experience and a trained eye can give a dental technician an idea of where the problems lie by looking at the muscle development through the neck and body.

Tension Patterns

There are of course many overlapping features with dental, behavioural and physical problems and any cause of discomfort will effect the horse throughout the body and on every level. The lists below are intended only as a guide to illustrate the effects of postural changes within the horse.

Mouth, Face and Head

Tension in the mouth area generally signifies a horse that is overly emotional and sensitive. It is generally linked to tension being present through the whole horse and is often accompanied by a tight chin and tension in the TMJ. The horse may find it difficult to accept treats and may clamp on the bit when ridden. He may bolt his food and snatch hay instead of eating in a calm leisurely fashion. Tension in the face can be an indicator that a horse lacks trust. He may be head shy and dislike being bridled, haltered and caught. He may be reactive to things moving around the head area or objects moving towards

him. Tension in the mandible is linked to an inability to learn, and horses with this tension pattern can be slow to mature. They can lack concentration and be frustrating to train as they may appear to forget lessons learnt in the previous training session. Some horses with tension around the face will have a cold patch on the nasal bone. This is often present in horses that are overly spooky. The breath may be cold. This cold patch often diminishes once the posture is returned to a more natural state.

This pattern can be linked to:

- Nervousness
- Eating difficulties
- Reactive, flighty behaviour
- Immaturity
- Biting
- Issues with dental work, paste working and biting
- Aloofness
- Lack of trust

Any oral imbalance can cause discomfort in the mouth. Diseased teeth, sharp buccal and lingual edges, hooks and ramps, stepped and missing teeth etc are likely to be present. There will generally be poor muscle development around the face, tension in TMJ, and sore or uneven temporal muscles.

Ears and Poll

Tension in the poll and neck will impair blood flow to the brain and can lead to sudden, volatile behaviour as well as inhibiting learning ability. It often accompanies the high headed posture and tension in the back. The ear may be cold to the touch as circulation to the poll is impaired. The horse may have a floppy bottom lip and the eye will have a tendency to be more almond shaped than round indicating a lack of tolerance and discomfort. He may find pole work difficult since tension in the poll is often linked to a lack of awareness in the lower leg and hoof. The lower leg is likely to be cooler to the touch.

This pattern can be linked to:

- Ear shyness
- Bridling and haltering issues
- Reluctance to being caught
- Pulling back when tied
- Noise sensitivity and general flighty behaviour
- Tripping and stumbling
- Rearing
- Napping
- Dislike of objects on the ground
- Clingy, insecure behaviour

Ramps, hooks, protuberant teeth, stepped and missing teeth, wedges and a ventral smile are likely to be present. A horse with

this pattern will need a significant amount of rehabilitation although early changes in behaviour and performance should be noticed.

Neck

Tension in the neck can cause the mane to fall in different directions along the crest although it should be noted that changes in the lie of the mane might also be linked to whorls present in the coat. The mane may change from one side to other part way down the neck or may zig zag all the way down to the withers. The angle of the head and neck determines how much airflow can pass to the lungs. A horse that is tight through the neck may be reluctant to work for long periods of time due to the stress imposed on the body as a result of restricted airflow. Tension in the neck is often accompanied by a high head carriage, a hollow back and the development of a bottom line rather than a top line. The hindquarters are generally underdeveloped with a tendency towards a flattish appearance in the pelvic region. This pattern can be linked to:

- **An inability to stand in a quiet relaxed manner – he may be pushy with his head and inclined to fidget.**
- **Pulling back when tied**
- **Spooky, nervous behaviour in hand and under saddle**
- **Depth perception problems**
- **Reactivity to light or bright objects**
- **Hesitation in moving from light to dark areas and vice versa**
- **Tendency to drop behind or above the bit when asked for collection**
- **Napping and reluctance to move forward**
- **Lack of engagement**
- **Digestive problems**
- **Stiffness through body – lack of flexion**
- **Clingy behaviour**

It is likely that retained caps, incisor problems, ramps and hooks etc may be present making it impossible for the horse to lower his head. In studying the dental records of three horses with virtually the same tension pattern described above including over bulking around C4/C5 on the right side of the neck, all were found to have the following pattern of oral imbalance – lower 11 ramps, protuberant 10s, lower 6 ramps, (all worse on the right), wedged incisors (higher on the lower right and upper left.). The horses ranged in size from 14hh to 17hh, are a variety of breed types and are all owned and ridden by different people.

Shoulders and Withers

Tension in the shoulders will create balance problems and the horse will find it hard to engage. He may lean on the reins for balance and may have a tendency to work on the forehand. He

may find it hard to work in a circle and may drift to one side when ridden. Tension in the base of the neck and shoulder area will often cause the horse to throw his head in the air during upward transitions. The stride will be short and intermittent gait irregularities will occur. The horse will generally be tense in the girth area and react to be saddled. Hollowing behind the wither area can be linked to narrow saddle fit but also oral discomfort. Horses with severe muscle loss in this area can be spooky and may go on to develop chronic obstructive pulmonary disease as acupuncture points for the Lung meridian are found in this area.

This tension pattern can be linked to:

- Saddling issues
- Falling in on to his shoulders through turns and circles
- Short, choppy stride with snatching hock action
- Difficulty in foreleg being pulled forward for farrier
- Crowding and barging when being led
- Difficulty working on one specific rein
- Inability to track up
- Pawing the ground
- Intermittent lameness
- Gate irregularities

Dental changes that are linked to this type of posture include retained caps, changing deciduous teeth, ramps, hooks, wave, wedge, smile etc.

Back

Most patterns of tension will cause some degree of tension through the back. Problems can start in the mouth and work backwards or begin in the pelvic region and move forward through the back to the mouth. They can originate from an incorrectly fitting saddle but may arise as a result of the horse hollowing away from bit contact giving the appearance of a badly fitted saddle. Once the dental issues are addressed the back may be able to develop correctly and the saddle fit may be correct. The majority of horses that buck are often tight in the lumbar area.

This tension pattern can be linked to:

- Blowing out belly when saddled
- Dropping to the floor when saddled
- Reactivity to saddling and rugging
- Bucking
- Jigging
- Moving away from rider when being mounted
- Rushing fences and jumping flat and fast
- Bolting
- Pacing

- Biting
- Reactivity to being groomed
- Overly sensitive or shut down to leg aids
- Fatigue
- Poor or excessive weight gain
- Dislike of contact in sheath area

Wedges, ramps, waves, uneven table angles, incorrect mandible/maxilla alignment and smiles have all been found in horses with abnormally high levels of tension in their back. Whilst these dental abnormalities are reasonably common findings in many horses, those with significant back tension have more severe dental problems. Even in horses as young as four the pattern of oral imbalance coincides with the severity of physical problems.

Pelvis

A horse with a dropped or rotated pelvis will generally have an imbalance in the opposite side of the TMJ. The horse may be more reactive to contact in this area and will generally have trouble working on this rein. He may hang on the bit or on one rein, tilt his head, or come above or below the bit. There is likely to be stiffness and tension around the C4 and C5 vertebrae and sensitivity in the mid thoracic spine. The horse may have a tendency to drop weight or be a poor doer. He may be sluggish to ride or over reactive and will find it hard or impossible to engage.

This tension pattern can be linked to :

- Lack of impulsion
- Kicking out
- Stringhalt type action
- Tail swishing
- Difficulty with stepping back
- Saddling issues
- Reactivity to movement behind the horse
- Clamped or excessively loose tail
- Inability to engage behind
- Inability to track up correctly
- Rushing through narrow spaces ie gateways and stable doors
- Loading and travelling issues

On examination, a horse with this type of pelvic imbalance often has a wedge mouth, with hooks, ramps, rims etc. Tension in the TMJ is often apparent and will generally be on the opposite side to the rotation i.e. a lower left hip joint will cause a problem in the right TMJ and vice versa. This correlation between the pelvis and TMJ is seen over and over. This pattern is common has many horses suffer from a dropped pelvis due to rider posture and/or poor saddle fit.

Effective dental work has to be done in conjunction with appropriate body-work to help not only correct but maintain a more desirable and effective posture. Once harmony has been restored, routine maintenance work is generally all that will be needed, provided the horse has been able to maintain a 'correct' posture after the rehabilitation process ends. Chronic physical problems however will always have a knock on effect and basic float work may not always be enough to maintain the health of the horse's mouth.

Although in an ideal world, the equine dental technician is looking to bring the mouth into three-point balance, it is important to recognize that this may not always be possible in the first, second or even third visit. If the horse has been working incorrectly over a number of years, the Central Nervous System must be allowed time to process the changes that are taking place and supportive body work must be done to help correct muscle loss, over bulking of muscle and/or skeletal changes. Saddle and bit fit, and general management and training techniques may also need reviewing. If long-term problems exist with the neck, back and pelvis it is virtually impossible to bring the molars into balance until the physical problems have been addressed. Even then it is imperative that the mouth is checked regularly as small imbalances can re-occur due to habitual postural tendencies. Similarly, the work of the TTEAM Practitioner, Physiotherapist, or Chiropractor etc will be hampered if dental problems are not adequately addressed. Behaviour and performance issues cannot be overcome and improvements to the overall well being of the horse will be minimal.

With an understanding of the correlation between dental care, performance and posture it is important to remember that even the most basic levels of equine dental work should be approached with diligence. The angle that a float is held at can reverse table angles and thus potentially cause a problem through the body. The amount of imbalance in the mouth seems to have little impact on whether a corresponding problem will or will not occur – it seems only to determine the length of time it will take for the problem to become apparent to the untrained eye.

Summary

The majority of horse's labelled as 'difficult' or 'quirky' are generally found to be in need of dental care. They are often incorrectly muscled, inconsistent in their performance and generally have restricted movement through the body due to tension, stiffness or discomfort. They may simply be slow to learn, or downright dangerous to handle and ride. However they respond to the physical difficulties that they have, they are unlikely to fulfil their true potential. Success, if attained, may be

very short lived. Addressing the issues results in increased longevity, reduction in mental, emotional and physical stress and a horse that is more likely to stay sound and happy in his work. The horse becomes safer to ride and handle, and better utilises the feed, not just through oral balance but through a lower metabolism as stress levels are reduced or non existent. Trainers can quickly assess whether a horse is suitable for its chosen field as the horse is more consistent in its day-to-day performance. The horse cannot learn if fear, pain or tension exists in the body thus the need for repetitive training is reduced in the horse that is comfortable.

It is not necessary for Equine Dental Technicians to fully understand the training requirements of a horse in order to be effective in their work. However, as more demands and higher expectations are placed on horses and professionals in the modern world it is up to all those concerned with the health and welfare of horses to educate themselves to the best of their ability for the benefit of the horse. Working with other professionals can often enhance the skills we have to offer. If we are not prepared to be a part of the solution, it may be that we become a part of the problem.

NB – The information contained in this thesis is not to be used as a replacement for appropriate veterinary care. If a horse has a serious behavioural or physical problem it should be seen by a vet, who will refer the owner to the necessary professionals if appropriate.