

# Headshaking

By Dr John Kohnke BVSc RDA

Headshaking can be a difficult problem to diagnose and manage. Research has shown that the incidence is increasing in horses between 6 and 12 years of age.

Headshaking was first described almost 200 years ago. It is characterised by an uncontrollable, often repetitive vertical and horizontal (head nodding) or rotary movement of the head and neck, often without any obvious external cause or stimuli. Some horses also rub their face and nostrils, often on the front legs or on fences. A number of affected horses might also snort regularly and these horses often have mild nasal discharge. Some horses exhibit only mild or intermittent symptoms, others develop a frequent, violent headshaking habit with the appearance of distress. They might continually rub the sides of the face, strike out at the face and nose, head press against surfaces and carry their head low or high when ridden. Some show what is termed 'glass wall syndrome' when under saddle, where they might refuse to go forward and can even rear if strongly encouraged to continue working. These behaviours can make the horse difficult to handle and dangerous to ride.

The exact incidence is not known, but horses used for dressage, jumping and other equestrian sports can develop the typical symptoms. It is considered to be more common in geldings and the condition is usually first noticed when the horse is an adult. Headshaking is now regarded as a disease, not simply as a neurosis or behavioural vice in the majority of affected horses.

## Underlying Cause

If no other cause can be diagnosed, for example head trauma, ear mites or other factors discussed over the page, the headshaking condition is termed 'idiopathic headshaking'. Research efforts from

around the globe have been able to shed some light on this type of headshaking in horses. Researchers in the UK suggested in 2000 that the behaviour is due to increased sensitivity in the trigeminal nerve which provides sensation to the upper face, nose and muzzle areas. Local anaesthesia of the rear nasal branch (maxillary) of the trigeminal nerve in the studies resulted in an 80-100% reduction in clinical signs in most headshakers. The researchers also found that fitting a nasal filtering mask to slow the air entering the nostrils and inhalation of particulate matter can reduce the signs of headshaking by 90-100% in most headshakers. However, when the mask is removed, the symptoms often return. This supports the theory that there is a trigger zone in the rear nasal cavity.

Research published in *The Australian Equine Veterinarian* in 2015 confirmed that idiopathic headshaking is related to the trigeminal nerve, most likely the maxillary branch of this nerve. The researchers suggest that affected horses are overreacting to seemingly trivial stimuli, such as air in the nostril, or nasal irritation from pollen. The response of the trigeminal nerve to these stimuli is to trigger the sensation of severe sudden pain.

It is suggested that even an increase in heart rate and blood pressure could trigger headshaking in some horses. It has been observed in a number of horses that their headshaking is in time with their heart rate. This has also been observed in the human condition called Human Trigeminal Neuralgia. In humans, a large artery leading to the brain (posterior cerebellar artery) is in very close contact with the trigeminal nerve. A surgical technique to insert a teflon/titanium plate between the artery and the nerve can dramatically resolve the symptoms of trigeminal neuralgia in human patients. In contrast, the trigeminal nerve is not in close contact

### Handy Hint

#### Headshaking Habits

A headshaker will often develop a violent flicking movement of the head and neck, resembling the type of reaction a horse might have to a fly or bee on or up the nose. The horse may rub the nose and sides of the face on its front legs, rails and feed bin as if it is itchy, in pain or has an allergic reaction. Most horses initially start to exhibit signs when being exercised, becoming more intense and frequent when the exercise effort is increased or prolonged, but as the condition progresses, many headshake when standing at rest.

### Handy Hint

#### Mask Magic!

A fine muslin or gauze net or veil, such as the foot area of a large pantyhose, which fits loosely over the nostrils and muzzle area designed to slow air intake and filter out and prevent allergic particles reaching the rear of the throat 'trigger zone', has been shown to be successful in 75% of cases. A simple nose flap to allow grazing, or a mask similar to a grazing muzzle, with a gauze cover over the nostril area is also successful in 50-60% of horses which headshake under windy or dusty conditions.

Fitting a dark gauze fly mask when horses are grazing or working under bright sunlight conditions is often used as a first form of management in horses which may have a 'photic' trigger for headshaking.



with the posterior cerebellar artery in the horse but it is, however, in contact with the infraorbital artery. This lends credence to the theory that increases in heart rate and blood pressure could be a trigger for headshaking in some horses.

Studies have also shown that symptoms reduce when the horse is given the drug carbamazepine (CBZ), which is an anti-epileptic drug used to treat trigeminal nerve neuralgia in humans. This further supports the theory that headshaking in horses may be related to hypersensitivity of the trigeminal nerve.

## Other Causes

Over the past 20 years, a number of other causes have been linked to headshaking. These include ear mites, ear infections, sinus inflammation, upper jaw bone cysts, dental problems, eyeball injury, allergic sinusitis and rhinitis (hayfever like symptoms with sneezing and nasal rubbing), diseases of the guttural pouch and inflammation of the nerves around the eyes. Headshaking is often seasonal with the highest incidence in spring and early summer.

Prof. Robert Cook from the USA, a specialist in airway disease and associated behaviours, considers that partial restriction of nasal air flow by pulling the head down artificially with running reins can lead to headshaking in some horses during exercise. Although he has developed a 'Bitless Bridle' which is claimed to eliminate pressure around the mouth and nose to relieve headshaking, it has not been successful in preventing symptoms in the majority of headshakers.

**Headshaking is seen more commonly in dressage, pleasure horses and ponies compared to racing horses. This may be because even very mild signs are noticed in dressage horses, or there may be an influence of partial restriction of airflow due to the flexed neck during exercise, or because of poll pressures from the bridle.**

It has been thought in the past that headshaking could be similar to photic sneezing in humans. Since horses are unable to sneeze, the theory was that they experience a distressing sensation that can't be relieved. Research has also largely discounted the theory that bright sunlight causes a 'photic sneezing' type sensation in horses. Some horses might show an increase in symptoms when exposed to bright sunlight, but the main reason for this is unknown and it may be that in many cases, it is not the sunlight that is the trigger, but another factor, such as pollen in the air when they are exercised outdoors.

## Classification

A clinical classification of a headshaking case is useful because it can be used to follow changes to symptoms and it can also help assess whether treatment options are working.

### Seasonal/Non-Seasonal

Horses can be assessed as having either seasonal or non-seasonal headshaking when a number of years have passed and observation of the pattern of symptoms has been made. Some horses might have seasonal headshaking when the condition first appears, but then lose the seasonal aspect of the condition and experience it all year around. Other horses might never show a seasonal pattern to the symptoms.

### Intermittent/persistent

This classification is used on horses to establish whether the condition persists all the time, or whether it is triggered by known stimuli, such as wind, exercise, rain or sunlight.

## Severity

Dr Knottenbelt of the University of Liverpool in the UK classified the severity of symptoms into 5 grades for clinical evaluation.

**Grade 0** - Not a headshaker.

**Grade 1** - A slight 'tic' or nod might occasionally be seen by an observant owner or trainer.

**Grade 2** - Signs can be easily noticed by a rider or trainer but the horse's work under saddle isn't greatly affected and there are no signs of distress in the horse. These horses sometimes snort and may 'clamp' their nostrils when being exercised.

**Grade 3** - Obvious signs of up and down or sideways movement of the head. The horse might have abnormally high or low head carriage under saddle. Snorting, sneezing and face rubbing is commonly seen in these horses. Ridden work can be difficult and sometimes dangerous, the horse might lose its stride and may strike out at its face or might stop responding to the rider's aids. The nostrils 'clamp' frequently and there may be nasal discharge.

**Grade 4** - These horses are dangerous to ride. The head movement is severe and abrupt. The 'glass wall syndrome' is commonly seen and the horse might rear or turn suddenly rather than continue forward. The horse is in obvious distress and might strike at its face during work at any pace, potentially resulting in a dangerous fall if the horse stumbles. Grade 4 horses often seek to protect their face in shade, or even submerged in a water trough or pond. They will also often snort and rub their face and nostrils.

**Grade 5** - This severe grade of headshaking is seen in horses that are clearly distressed and it is almost impossible to touch them near the face. They will often sweat profusely and they are very dangerous to be around. They cannot be ridden or handled safely.

## Diagnosis

Over the years, a standard routine has been developed to help diagnose and attempt to pinpoint the possible underlying causes of headshaking, so that the appropriate management and treatment, if warranted, can be prescribed. A diagnostic work up can include X-rays of the head to help diagnose anatomical or disease problems, endoscopic examination of the throat and guttural pouches, nasal biopsies and a blood sample to test for Equine Herpes Virus antibodies. Testing can also include investigation of inflammatory problems in the eyes or ears. Once all of these testing procedures have been exhausted and no clear reason for headshaking can be found, it is then considered to be 'idiopathic headshaking' and further investigations will focus on the triggers for the condition.

Many owners and vets test the benefit of a close fitting perforated nasal mask to limit and alter airflow into the nose to see if this reduces symptoms. Relief may also be provided by flushing the rear nasal cavity with warm saline solution and local anaesthetic, which can further show whether the horse is being affected by environmental triggers.

Blue or green tinted contact lenses fitted to limit UV light induced photic stimulation, may result in improvement over 5-7 days in some horses. This reduction in symptoms can indicate a response to bright light in some horses affected by headshaking.

Local anaesthesia of the rear nasal branch of the trigeminal nerve to block the sensory branches in the rear part of the nasal cavity often relieves signs in 80-90% of 'idiopathic headshakers'.

## Treatment for Headshaking

Establishing the underlying cause, and a successful method of relieving or controlling headshaking in horses, can be frustrating and unrewarding. Research has shown that the most consistent underlying cause of idiopathic headshaking is related to hypersensitivity of the rear nasal branch of the trigeminal nerve. It is likely that it involves a possible trigger zone and sensitivity in the nasal cavity and face when the horse is exposed to wind, pollen or other triggers.

In cases where a cause, such as ear mites, guttural pouch infections or eye problems, has been established, treatment of the underlying condition should resolve the headshaking behaviour. Because the underlying cause of headshaking varies between affected horses, a consistently successful form of therapy has not been developed. A number of 'trial' treatments are often evaluated to determine the most effective course of management in a particular horse. The aim is usually to prevent the 'trigger zone' being activated by influences such as wind or pollen, or to reduce the activation of the trigeminal nerve in the presence of 'triggers'.

### 1. Reduction of UV light

Although coloured contact lenses have been trialled, only very few cases show reduced headshaking.

### 2. Nasal Masks

A sensitivity to inhaled particles, particularly under windy conditions or when being exercised, often during spring and early summer, appears to trigger headshaking in many horses with a seasonal occurrence. The use of a mask can be successful in some horses. Refer to handy hint on page 1.

### 3. Drug Medication

Antihistamines and steroids - Some horses respond to these medications when the trigger factor is an allergic response.

In horses that show a clear sensitivity to light, the use of sodium cromoglycate eye drops has been shown in a study to reduce the symptoms of headshaking. Discuss with your veterinarian to determine whether this would be a suitable treatment for your horse.

The drug Gabapentin is used to treat some types of seizures in humans and nerve pain caused by shingles. It may reduce signs of headshaking in horses as it can have a pain relieving affect. However, researchers have noted that very few horses are helped long term with this treatment option.

Although in humans, medication with the anti-epileptic drug carbamazepine (CBZ) to control trigeminal hypersensitivity is effective, 50% of horses show no response. However, when a very high dose of the drug is given frequently (as it is not as well absorbed in horses as compared to humans), 90% of horses showed clinical improvement. The drug is expensive and new dosage regimens are under review. It may be worth trying under veterinary advice as a small number of horses respond well to reduced doses. In some rare cases, the symptoms completely resolve and the drug treatment can be withdrawn completely without the horse reverting to showing signs of headshaking.

### 5. Surgical treatment

**Trigeminal Nerve Block** - Studies have shown that local anaesthesia of the caudal nasal branch (CNN) of the trigeminal nerve performed in a sedated, standing horse, may relieve symptoms in 60-100% of horses during the time the nerve block was effective. Although 50% of horses treated with a preparation to damage (sclerose) the CNN nerve trunk showed improvement,

the maximum period of relief was 10 months. Research is continuing in this area as it promises to be a useful possible treatment in the future.

**Tracheostomy** - Although surgery to form a permanent 'hole' in the windpipe has been used successfully in some horses, perhaps by diverting air flow away from the 'trigger zone' in the throat, it is a last ditch attempt to overcome headshaking. The maintenance of the site is a problem in most horses to avoid lung infection, although the tube can be removed when symptoms are not present.

### Percutaneous Electrical Nerve Stimulation (PENS) -

Researchers from the University of Bristol in the UK reported a possible new treatment for headshakers in a press release issued in January 2015. In their study, 7 horses with idiopathic headshaking graded at least 2-3 underwent the PENS treatment. This involved inserting a disposable PENS probe under the skin to stimulate the trigeminal nerve for 25 minutes, this was then repeated on the other side of the face. The horses tolerated the procedure well, although some of them developed some facial bruising that resolved. Six of the horses responded after the first treatment and were able to return to the level of work they were performing at before signs of headshaking had first appeared. Symptoms reappeared at an average of around 4 days after the first treatment, at which time, a follow-up treatment was given. The average time for symptoms to appear again after the 2nd treatment was 2.5 weeks, then 15.5 weeks after the 3rd treatment and 20 weeks after the 4th treatment. The results of this pilot study show an exciting prospect for a future treatment regime for 'idiopathic headshakers', where the condition involves the trigeminal nerve. Further work is required before this becomes a commonly used treatment in veterinary practice.



*PENS therapy being performed on a horse*

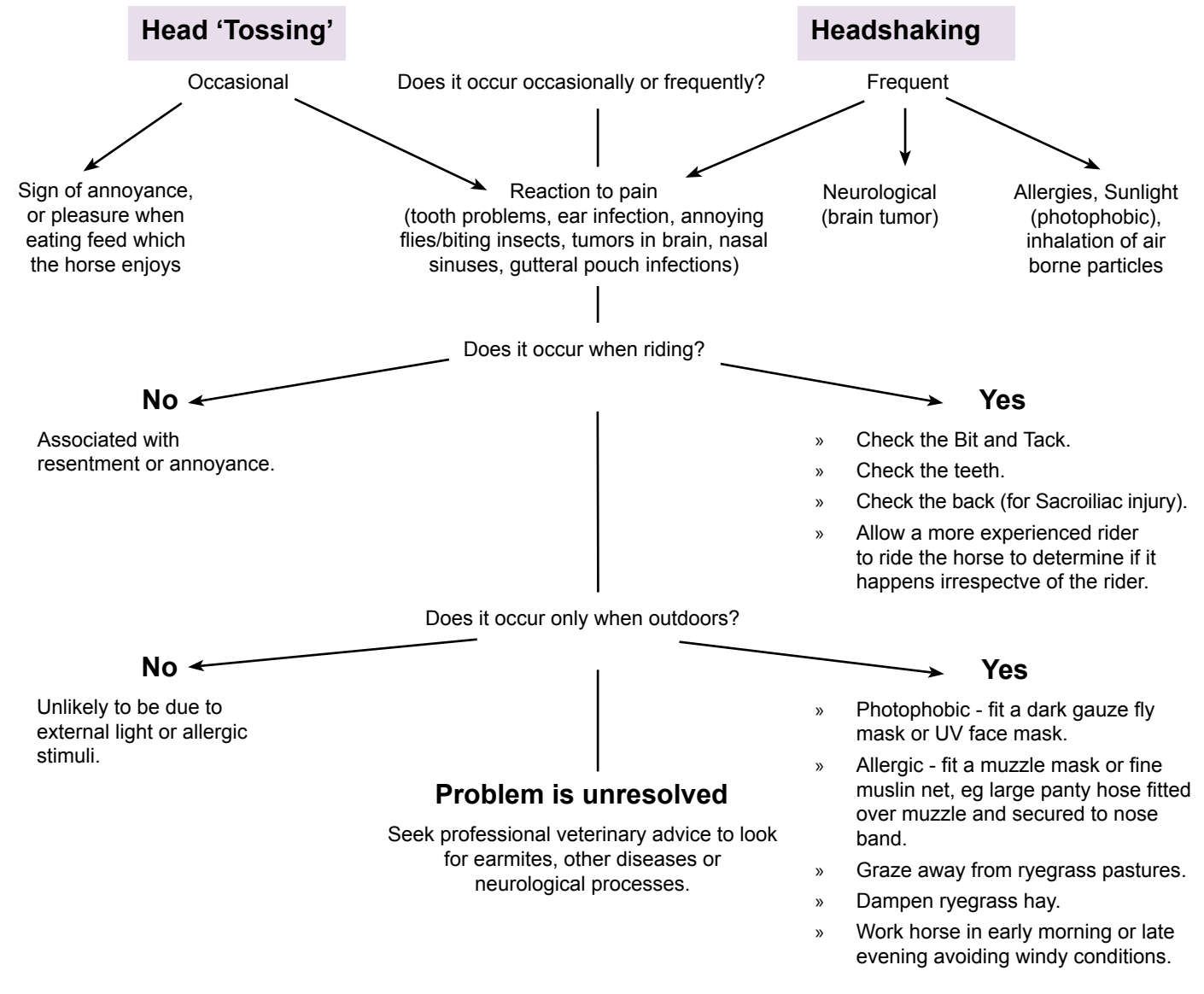
### 6. Diet and supplements

Although there are many theories on herbal and dietary supplements to treat headshaking in horses, very few have proved to be beneficial.

In a study that documented the outcome of treatments that owners had tried, around half of respondents who used a supplement of magnesium reported a reduction in symptoms within 2 days to 4 weeks. One horse completely stopped headshaking after being supplemented with magnesium. Some owners reported that their horses seemed calmer, as well as showing reduced symptoms. The researchers suggest that magnesium increases the threshold of nerve stimulation. This indicates that in cases of trigeminal nerve involvement in the headshaking condition, a larger 'dose' of triggering factor (pollen, wind etc) would be required to activate the nerve in horses supplemented with magnesium. A daily supplement of Kohnke's Own® Mag-E® (available as Harmony™ in Europe), containing well-absorbed organic magnesium chelate may be worth trialling in an affected horse.

## Head 'Tossing' or 'Headshaking'

Head 'tossing' is usually an immediate but occasional reaction to resentment or annoyance or occurs during feeding as a sign of pleasure when eating. However, when head 'tossing' becomes more frequent or occurs repeatedly when triggered by a physical or an external stimuli, it is considered to be a behavioural problem related to a neurological condition, pain, or an allergic response, and is regarded as a 'headshaking' habit.



### References

1. DC Knottenbelt 2015 *Headshaking - Where Are We Now?* The Australian Equine Veterinarian, Vol. 34, No 1.
2. SA Newton, DC Knottenbelt, PR Eldridge 2000 *Headshaking in Horses: Possible Aetiopathogenesis Suggested by the Results of Diagnostic Tests and Several Treatment Regimens Used in 20 Cases* Equine Veterinary Journal, Vol. 3
3. CE Stalin, IP Boydell, RE Pike 2008 *Treatment of Seasonal Headshaking in Three Horses with Sodium Cromoglycate Eye Drops* Veterinary Record Vol. 163, No. 10.
4. KJ Pickles, M Aleman, DJ Marlin, VJ Adams, J Madigan 2014 *Owner-Reported Response to Treatment of 130 Headshaking Horses* American Association of Equine Practitioners (AAEP) Proceedings, Vol. 60.
5. VLH Roberts, NK Patel, WH Tremaine *Neuromodulation Using Percutaneous Electrical Nerve Stimulation for the Management of Trigeminal-Mediated Headshaking: A Safe Procedure Resulting in Medium-Term Remission in Five of Seven Horses* Equine Veterinary Journal, Published online April 2015

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