



# VET NOTES

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Dr. Hayley Sullivan is from the Palos Verdes Peninsula, a surfing and horse community in the Los Angeles area. There she grew up riding, playing basketball and dreaming of becoming an equine veterinarian. Hayley attended the University of California, Davis where she received a bachelor's degree in animal science with an equine emphasis. While at UC Davis she was a member of the three-day eventing team and was a manager for the campus' intramural sports program. She then moved back to Southern California and attended Western University of Health Sciences for her DVM.

Hayley is a three-day event rider who has competed through the CCI 1\* level with her OTTB. As an HA traditional graduate of the USPC, she is an instructor back home for the Portuguese Bend Pony Club. Teaching eventing to young riders is one of her passions. Her professional interests include equine surgery, sports medicine, imaging, cardiology and anesthesia. In her free time she enjoys road trips, camping, live music, hiking, crafting and rock climbing.

“Headshaking

by Hayley Sullivan DVM

“Headshaking” is a frustrating disease for owners, riders, and veterinarians. Also known as trigeminal nerve-mediated headshaking, it is a disease that occurs spontaneously and consists of behavior changes such as throwing of the head in horses. Other clinical signs of the disease include jerks of the head, snorting, rubbing of the muzzle, and sneezing... all without an apparent stimulus for the behavior.

The signs of this disease are caused by increased sensation, or a sharp burning pain, in a nerve called the trigeminal nerve. The trigeminal nerve is one of many nerves that comes directly from the brain, called cranial nerves. The trigeminal nerve in particular, exits the horse's skull just to the side of the eye and then travels all the way down to the muzzle. It allows the horse to feel sensation on their face, and to contract the muscles used for chewing. Why this nerve

becomes painful in horses with this disease is unknown. It has recently been found however, that the nerves of these horses is more easily excitable than the trigeminal nerves of normal horses.



<https://equusmagazine.com/diseases/nerve-in-headshaking>

Horses may exhibit these signs intermittently or continuously, and they may become worse with increased exercise. Signs are also seasonal in 60% of horses, with peaks of the clinical signs occurring in Spring and early Summer in these cases. Interestingly enough, some horses exhibit signs only when it is sunny out! Geldings tend to be most affected, with the average age of onset being 8 years. All breeds of horses can be affected with the disease, but thoroughbreds, warmbloods, and quarter horses are most common.

Diagnosis of this disease is based on history, observation of the behaviors, and elimination of all other potential causes of the behavior changes. Endoscopy and radiographs of the head are performed, to make sure that all of the anatomy appears normal before diagnosis of this disease can be made. Numbing the trigeminal nerve with a drug such as lidocaine, is a diagnostic procedure that can be performed to confirm the disease. Reported success rates of this procedure are very low, however, so it is not considered necessary to make the diagnosis.

#### Treatment:

Due to our limited knowledge about why the trigeminal nerve is painful and easily stimulated, treatment of the disease can be difficult. Currently, there are no treatments that are completely safe, totally effective, and curative in all horses. Therefore, management of the clinical signs to a tolerable level is our goal for treatment.

One of the easiest places to start for management of headshaking is a nose net. This is similar to a fly mask, but hangs down over the nose from the noseband of the bridle. It is thought that this net causes desensitization of the trigeminal nerve, via constant sensation in that area. 75% of owners report that improvement comes from using these products. Nose nets can be purchased online through many tack stores, and can be seen below in this picture:



[https://www.smartpakequine.com/pt/equilibrium-net-relief-muzzle-net-6680?utm\\_source=cpc&utm\\_medium=google&utm\\_content=shopping&utm\\_campaign=br\\_shopping\\_tes&utm\\_term=BR\\_Shopping\\_TES&gclid=CjwKCAjwspHaBRBFEEiwA0eM3kdb1y9O8nxkSS2CgeQSyRVU6VC9UjEy- apkudThagVzmzPRvNWZChoCI2wQAvD\\_BwE](https://www.smartpakequine.com/pt/equilibrium-net-relief-muzzle-net-6680?utm_source=cpc&utm_medium=google&utm_content=shopping&utm_campaign=br_shopping_tes&utm_term=BR_Shopping_TES&gclid=CjwKCAjwspHaBRBFEEiwA0eM3kdb1y9O8nxkSS2CgeQSyRVU6VC9UjEy- apkudThagVzmzPRvNWZChoCI2wQAvD_BwE)

Magnesium supplementation is another simple management tool that can be used in these horses. Magnesium can increase the time it takes for a nerve to become excited. Over 40% of horses in one study, showed improvement of their headshaking with magnesium supplementation. Excess magnesium is excreted in the urine, and toxicity has never been experienced in horses. After diagnosing headshaking, your veterinarian can help you determine how much magnesium to give to your horse daily.

If the nose net and magnesium supplementation together are not showing enough improvement in your horse, there are medications that can be tried next. A drug called carbamazepine has shown success in up to 88% of cases, however results vary. Make sure to check with the competition's governing body and their medication regulations before competing your horse while on carbamazepine, as this drug is not allowed at most types of shows. Potential risks of this drug are drowsiness and tiredness, which do occur frequently, but to a mild extend in most horses.

There are also some newer, more invasive options for treatment such as trigeminal nerve neuromodulation. This refers to physically modifying the electricity of the trigeminal nerve. To do this, electricity is sent through an electrode that is placed around the nerve on the horses face. It is thought that this "resets" the nerve into a normal firing mechanism. This treatment must be repeated multiple times for success and usually only causes temporary relief. In most horses, after four consecutive treatments, average time of improvement lasted 20 weeks before treatment was required again. Side effects of this procedure are very mild, and include small amount of bleeding around the nerve, or a few days of increased headshaking before improvement. This is often considered a last resort for treatment.

#### Prognosis:

In severe cases, the increased nerve sensation can be so intense that horses strike at their own nose with their forelimbs or rub their muzzle on stall doors causing trauma. In a small number of horses, the behaviors can become so intense that euthanasia is considered due to constant self-mutilation. Some horses with this disease however, spontaneously go into remission in months or years after first being affected. Miraculously, many of these horses never experience clinical signs again! The majority of horses affected with the disease however, do not fall into either of the above categories, and have moderate signs persisting for life without treatment.

**Prevention:**

Trigeminal nerve-dependent headshaking cannot be prevented. There is also no currently established genetic inheritance of the disease nor is there a way to test for risk of development.

If you think your horse may be experiencing the clinical signs associated with head shaking, come see us at Peterson and Smith Equine Hospital for help with this frustrating problem.

**References**

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3. Patel, N.K., Roberts, W.L.H., Tremaine, W.H. "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*. Volume 48, 2016, 201-204.
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