

All Shook Up

Headshaking syndrome can end your horse's career. Can anything be done?

Elaine Pascoe

It's a gorgeous spring day, and you're looking forward to a good ride. But minutes after your horse picks up a trot, he starts flipping his nose up and down. Is he lame? His stride seems even, and his head action isn't a typical lame-horse head-bob—it's a quick, snatching motion. Is his bit bothering him? You toss him the reins, but the up-and-down twitching continues. Is he just being a pill? You urge him forward to put his mind on work, but the motion only gets worse as he exercises harder. Soon he's snorting and flipping his head so violently that you have to stop and get off.

Headshaking syndrome, in which the horse shakes or jerks his head uncontrollably for no apparent reason, has puzzled riders, trainers and veterinarians for at least a hundred years. It's often blamed on everything from allergies to bad riding. There are still more questions than answers about this strange syndrome, but researchers are making progress in understanding and treating it.

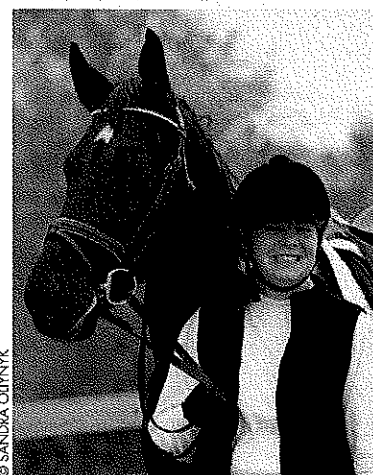
"The syndrome is very real and serious, and it can be devastating to horses and their owners," says Maryland rider Donna Davis. She knows firsthand—her Oldenburg gelding Fantom has had bouts of headshaking since 2003. "I really believe that horses suffer a lot of pain when they are affected, although I'm sure that some are accused of behavioral problems and punished for what is actually a physical problem," she says. For five frustrating years, Donna tried various treatments for her horse's headshaking, with little or no success. Last year she found a new treatment protocol from the University of California at

Davis finally brought Fantom some relief. She shares her experience in this article; and John Madigan, DVM, who has led the UC Davis research effort, offers expert advice.

Fantom's Seasonal Signs

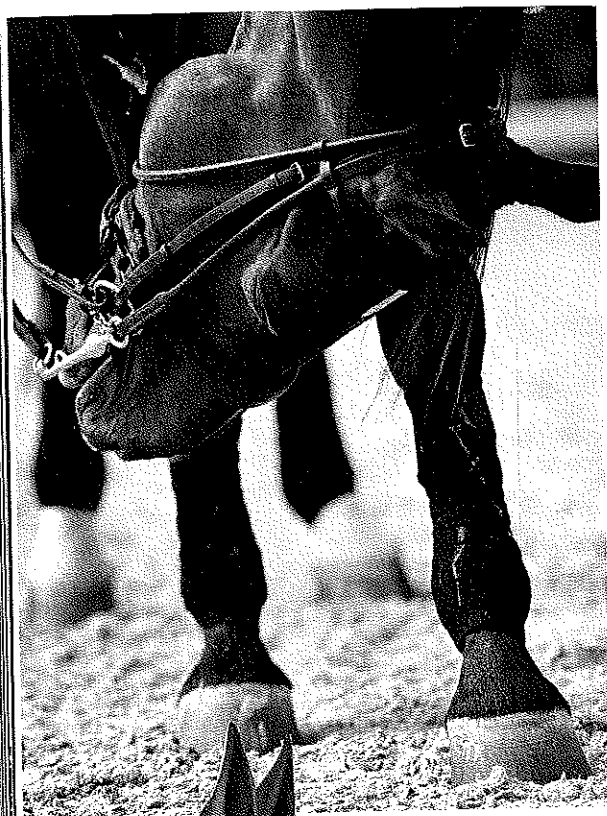
Donna bought Fantom as a 3-year-old, but he showed no signs of headshaking until age 10. "In fact, he was an incredibly sound, healthy horse and was very willing and reliable," she says. But once the problem started, it resurfaced with increasing intensity every spring. "He starts with a little snorting in March or early April, and by the end of May it's full-on. Sometimes he has been dangerous to ride or lead because he is flinging his head around so much. The signs taper off by the end of June or early July. It's really strange, because the rest of the year he's absolutely fine."

Fantom's case is typical, according to information gathered at UC Davis. Headshaking syndrome often starts suddenly when a horse is 9 to 11 years old, and it's more common in geldings than in mares or stallions. In one survey, 78 of 109 affected horses were geldings, 29 were mares, and two were stallions. Breed or use didn't seem to matter. Sixty-four horses were seasonal headshakers, like Fantom; in most, headshaking started in



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Donna and Fantom



LEFT: Signs of headshaking syndrome include the horse rubbing his muzzle on objects or even striking at his nose with a leg or hoof.

BELOW: The source of a headshaker's pain is the trigeminal nerve, which has branches throughout the nose, jaw and head.

a nerve, rather than in injured or diseased tissue. People who suffer neuropathic pain describe it as a burning, itching, tingling, shooting or electric sensation. For headshaking horses, the source of the pain is the trigeminal nerve, a sensory nerve with branches in the nose, jaw and other parts of the head.

Donna kept a diary of Fantom's signs, and she noted that his headshaking varied. It got worse with harder work—at the canter for example—whether she rode, longed or free-longed her horse.

"It seemed that the amount his nostrils flared, the amount of air rushing in and out of his nostrils, was a factor. It was worse on sunny, windy days and better on rainy or cloudy days." That, too, is typical. Headshaking ranges in severity from mildly annoying to so extreme that the horse is unsafe to handle, but it's often aggravated by exercise and sunlight.

Why Does He Do It?

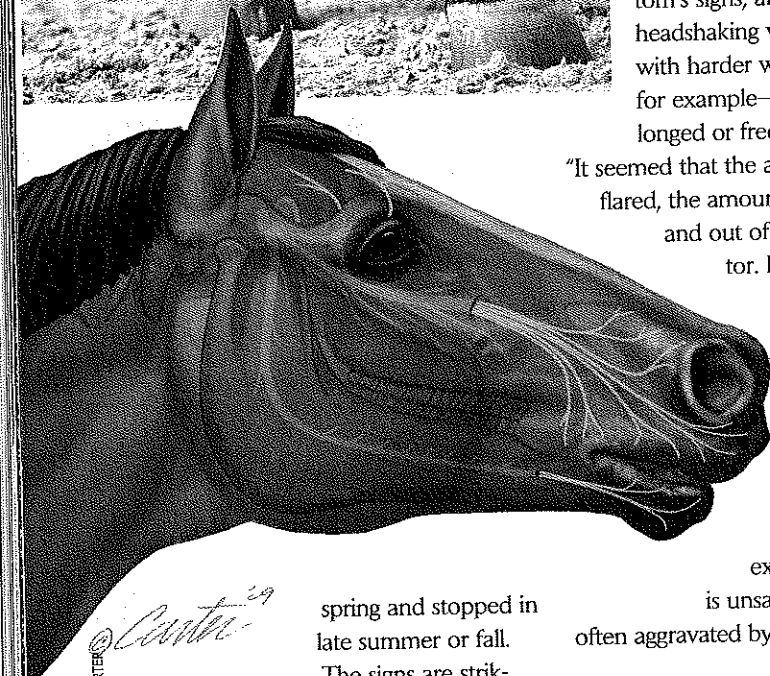
Ear mites, ticks, problems in the middle ear or upper respiratory tract, tooth problems, eye problems, neurological conditions like equine protozoal myeloencephalitis, discomfort from the bit or bridle—blame for headshaking has been pinned on all those conditions and more. The long list contributes to confusion, Dr. Madigan believes.

"Horsemen who suggest that headshaking is a behavioral problem probably haven't seen enough cases to recognize what is really a unique condition," he says. "It's independent of the rider or the bridle—the horse isn't rooting at the reins." The signs of headshaking don't fit most of the suggested causes, he adds, and in most cases diagnostic work doesn't turn up a physical problem. Researchers at the University of Liverpool in England have done postmortems on 80 cases without finding lesions or nerve damage. That makes sense, Dr. Madigan says: "You can't have nerve damage that comes and goes with the seasons."

Instead, a biochemical change makes the nerve hypersensitive, causing it to fire in response to some stimulus that wouldn't normally bother the horse. "Light plays a role in many cases," Dr. Madigan notes. "Some horses with extreme headshaking stop when blindfolded, so we know that light is affecting the trigeminal nerve." (The mechanism involves interaction between the trigeminal and optic nerves; a similar mechanism causes some people to sneeze in bright sunlight.) When light is the trigger, the syndrome is called photic headshaking. But the trigger isn't always light. For many horses a different stimulus—exercise, sound, smell, long-stemmed hay or something else—sets off the neuropathic pain.

The key question is why some horses develop this hypersensitivity when others don't. One thought was that herpesvirus might spark the problem. This virus can lurk in the horse's body for years without producing obvious signs of disease, and it can cause inflammation in nerves. But so far researchers haven't found signs of latent herpes infections in headshakers. "We're doing studies now to quantify the amount of herpesvirus in the trigeminal nerve, but there doesn't appear to be any association with that and headshaking," Dr. Madigan says. "In any case, the virus wouldn't explain the seasonality of the syndrome."

The fact that many horses show signs only at certain times of the year has



spring and stopped in late summer or fall. The signs are strikingly similar from horse to horse. "The horse acts as if a bug is flying up his nose," says Dr. Madigan, who has collected hundreds of videos of headshaking horses. "He shakes his head or flicks his nose up and down, snorts excessively, rubs his muzzle on objects and may even strike at his nose." The signs, Dr. Madigan says, are all consistent with neuropathic pain—pain that originates in

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made many people suspect allergies to pollen. But allergy treatments, including desensitization shots, generally don't solve headshaking. Researchers at UC Davis are investigating another explanation—reproductive hormones.

"Our theory is that gonadotropins play a major role," Dr. Madigan says. The theory may explain both the seasonal variations of headshaking and the fact that the syndrome so often affects geldings.

As days lengthen in spring, levels of gonadotropins surge. These hormones act on the ovaries of mares and the testes of stallions, stimulating production of the sex steroids testosterone, estrogen and progesterone. For mares and stallions, rising levels of sex steroids set up a negative feedback loop that inhibits the release of more gonadotropins. But for geldings, there's no increase in testosterone and no negative feedback. Gonadotropin levels stay high until the days grow short again.

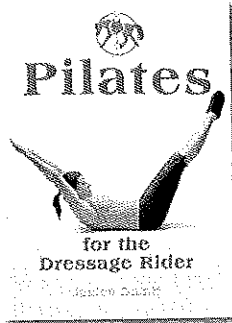
The theory is that elevated gonadotropin levels play a role in altering the biochemistry of signaling in the trigeminal nerve. "Some horses may have neural pathways, connections with the trigeminal nerve, that other horses don't," Dr. Madigan adds, "and that may be why they start headshaking in response to light or other stimuli."

Will Anything Stop It?

Donna consulted several veterinarians in an effort to stop Phantom's headshaking. "The vets were confounded," she says. She soon found that treating headshaking can be a long, frustrating process. Owners typically go through many different treatments, from antihistamines and anti-inflammatory drugs to acupuncture and homeopathic remedies, with little or no success. No treatment helps every horse, but these approaches have worked for some:

Masks: If light is a trigger, try having the horse wear an eye-shading fly mask that blocks ultraviolet rays.

Muzzle nets: If the horse is bothered during exercise, try a nose net or similar device. The nets are made of nylon



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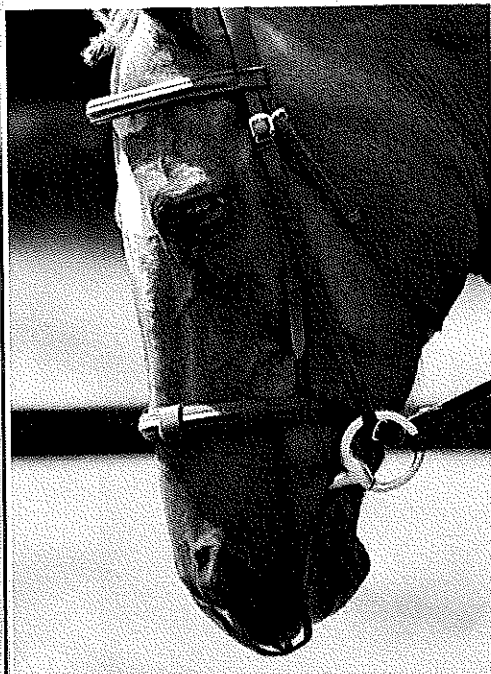
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A nose net is one option for managing headshaking syndrome.

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mesh and attach to the horse's noseband. There are several styles; some fully cover the muzzle, and some just hang over the nostrils. A British study comparing full and half nets didn't find significant differences between them. About 75 percent of owners in that study reported some improvement in headshaking symptoms with each net; 30 percent saw an improvement of 70 percent or more.

Medications: Drugs can help by altering nerve firing or controlling neuro-pathic pain.

Cyproheptadine (0.3 mg/kg twice daily orally) is the most widely used; in the UC Davis survey, two-thirds of owners reported that it helped their horses. An antihistamine, it also suppresses levels of serotonin, a body chemical involved in nerve signaling. It seems to work by inhibiting activity in the trigeminal nerve.

Other drugs that sometimes help

include carbamazepine (an antiseizure medication, given alone or in combination with cyproheptadine); hydroxyzine (an antihistamine); and gabapentin (used to treat neuropathic pain in humans).

Veterinarians at Cambridge University recently reported on another therapy: sodium cromoglycate eye drops. They administered the drops four times a day to three horses who were seasonal photic headshakers and saw significant improvements. (As Opticrom, a cromolyn sodium ophthalmic solution, this medication is used to ease allergy symptoms in humans.) Larger studies of the drops have yet to be done.

The list of treatments that haven't panned out is long. For example, the theory that herpesvirus might be involved led some people to give supplemental lysine (an amino acid), which is said to suppress herpes activity. But it doesn't help head-

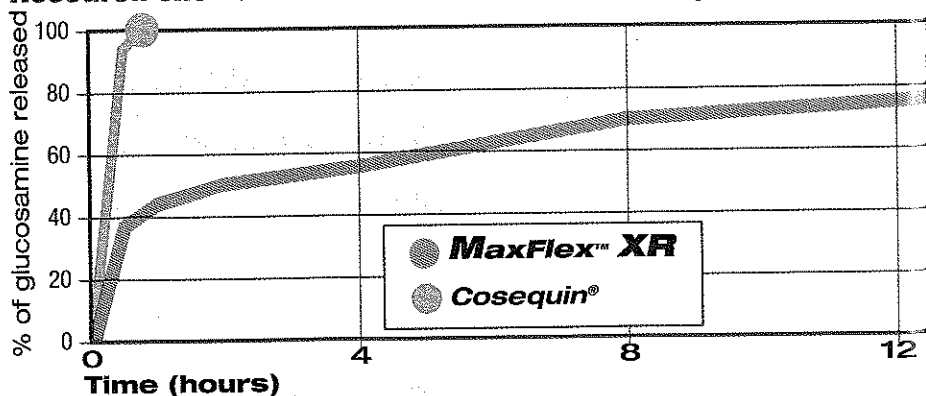
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shakers, Dr. Madigan says. Neurectomy (surgery to cut the nerve) is not an effective therapy, he adds.

A New Approach

Dr. Madigan is evaluating a program that targets the seasonal surge in gonadotropins that seems to play a role in headshaking. The surge is indirectly controlled by melatonin, a hormone that helps regulate other hormones. Darkness stimulates the production of melatonin, and light suppresses it. As days lengthen in spring, then, the horse makes less melatonin; and that sets in motion a chain of biochemical events that results in the surge.

In the UC study, horses get melatonin orally (12 mg for an average size horse) daily at 5 p.m., starting in late fall and continuing through their usual headshaking season. (Tablets are sold over-the-counter at vitamin shops.) This keeps the

horse's biorhythms set to "winter" and lowers gonadotropin levels. (It may also prevent him from shedding out, so he may need a body clip.)

"We're also looking at magnesium in the diet," Dr. Madigan says. Higher levels of this mineral, an electrolyte, are thought to minimize nerve firing, so horses in the study are getting a magnesium supplement. They're also getting spirulina, microscopic algae that are thought to decrease nerve stimulation, in the form of wafers.

Fantom is one of the horses trying the protocol. Before starting him on it, Donna had tried a gamut of treatments. Fly control had made no difference, and an eye-shading fly mask had helped only a little. Fantom had flatly refused to wear a nose net. He hadn't responded to cyproheptadine and had improved only slightly with hydroxyzine. Because his symptoms were worse on windy days and when pollen

counts were high, Donna had him tested for allergies; when the tests showed reactions to various tree and grass pollens, she followed up with allergy desensitization shots. His headshaking continued.

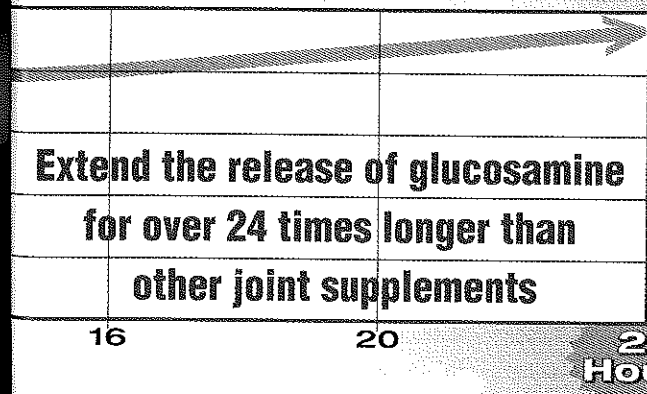
After contacting Dr. Madigan, she consulted with a local vet who helped her set up and monitor the protocol in 2008. Fantom started on melatonin and magnesium in late winter (he vetoed the spirulina) and continued into July, when she gradually weaned him off the program.

"It improved his symptoms about 90 percent," Donna says. Fantom also accepted a muzzle net for the first time—perhaps, she says, because his nose was less irritated. "There were only two or three days, all windy, when he couldn't work. He seemed to be very comfortable, and it was wonderful to see." She's hoping his second year on the protocol will be just as good. 🐾

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