

Long-distance Transport and the Performance Horse

Dr. Christine King

In my article on [adaptogens](#), I mentioned long-distance transport as one of the sources of stress in performance horses. Long-distance transport of horses is one of those common procedures which, like general anesthesia, goes well most of the time; but those few times it does go wrong, it tends to go *horribly* wrong! In fact, sometimes the simple act of transporting a horse long distance ends up being lethal. In most cases, though, the detrimental effects are far less dramatic.

Fatigue

Long-distance transport can affect a horse's health and performance in a number of ways. First, it is physically tiring. One study in horses showed that simply standing in a moving truck or horse trailer expends the same amount of energy as the equivalent time spent walking. In other words, if your horse has traveled for 8 hours, then he has used as much energy during the trip as if he'd been walking continuously for the same amount of time. That is probably insignificant on short trips, but on long trips (8 hours or more), it could tire the horse sufficiently to affect his performance if the horse is not adequately rested before competition.

Horses also need to sleep, which they don't get to do if they're traveling through the night. Horses don't seem to need as much deep sleep as we do, but they still need at least some deep, REM (rapid-eye-movement) sleep each 24-hour period, otherwise their mental and physical performance suffers. Just as your health and performance decline when you're sleep deprived, so it is with your horse.

It's important to allow your horse plenty of rest in a quiet, dark, well bedded stall (or other quiet, safe space) on arrival at your destination. How much rest the horse needs depends on the length of the journey and on the individual horse, but budget on *at least* one full night of undisturbed rest before competition begins. (And do the same for yourself.)

Susceptibility to illness

Even in seasoned travelers, long-distance transport is stressful to a horse. Elevations in blood cortisol levels are consistently reported in studies of long-distance transport in horses. Typically, blood cortisol begins to rise at the start of the trip, remains elevated throughout the journey, and then gradually returns to normal over the next 12–24 hours, provided that the horse is not stressed any further.

In case you haven't read the article on adaptogens, cortisol is a hormone that is released into the bloodstream by the adrenal glands during a stressful event. Its effects on the body are wide-ranging. Of particular importance in performance horses, elevated blood cortisol levels suppress immune function, interfere with glucose metabolism, and contribute to gastric ulcer formation.

The effects of elevated blood cortisol on immune function render stressed horses more susceptible to infections. In the show environment, with co-mingling of stressed horses from all over, horses are particularly susceptible to contagious respiratory diseases, such as influenza ("flu"), rhinopneumonitis ("rhino"), other respiratory viruses, and strangles

(*Streptococcus equi* infection). Shipping fever, or bacterial pleuropneumonia, is another possible consequence of transport stress in horses shipped long distance. (It's such an important complication of transport that it is discussed in more detail later.) Recurrence of latent EPM (equine protozoal myeloencephalitis) or equine herpes virus infection also can result from transport stress.

In addition to an increased susceptibility to infection, stressed horses are slower to recover from these illnesses. That's because tissue repair is one of the other jobs of the immune system, and it too is compromised by elevated cortisol levels.

As well as the measures I outlined in the adaptogens article for minimizing stress in performance horses, avoid close contact with other horses at shows. It may be impossible to avoid sharing air space with other horses, but you can avoid using communal water troughs and sharing buckets, bits, and other items that may transfer potentially contaminated secretions from horse to horse.

Weight loss and dehydration

Even when hay is provided in the horse's compartment and water is offered during frequent rest stops, studies of long-distance transport in horses consistently show that the horse's feed and water intake are decreased during long-distance transport. The net result is mild weight loss and dehydration.

The typical amount of weight lost on long trips (e.g. 24 hours of road transport, flying from Europe to the US) is in the range of 4–5% of the horse's body weight. That may not sound like much, but 4% is around 50 lbs for a 1200-lb horse. Some of that weight loss is water loss (i.e. mild dehydration); however, it's not all water loss. One study in preparation for the Olympic Games in Atlanta found that horses flying to the US from Europe lost an average of 4% of their body weight during transit, and it took them about a week to regain it. Mild dehydration can be corrected in a matter of hours if the horse is provided with ample clean water. Some of this weight loss is a reduction in the weight of the intestinal contents; but that, too, can be replaced within hours once the horse resumes her normal feed intake. For it to take a week for a horse to regain all her lost weight, she must also have lost some fat and/or muscle mass.

Either of these alterations (weight loss and dehydration) alone can adversely affect a horse's exercise capacity. Together, they can markedly affect a horse's performance. If you want your horse to perform at her best, then she needs time to rest, drink, eat, and replenish her body stores after a long trip. This need for rest and renewal should be factored in to your travel schedule so that your horse is back to peak condition by the time competition begins. Again, how much time is required depends on the length of the trip, on the individual horse, and on the type and intensity of the activities she'll be required to perform; but budget on *at least* 24 hours.

Pleuropneumonia (“shipping fever”)

One of the potential consequences of long-distance transport in horses is "shipping fever," or pleuropneumonia—bacterial infection of the lungs and chest (pleural) cavity. Pleuropneumonia is potentially fatal on its own. When laminitis (“founder”) develops as a complication, which happens all too often, the prognosis is even worse.

Pleuropneumonia is relatively uncommon when one considers how common long-distance transport of horses is these days. However, it's an ever-present risk when transporting horses long distance. I once heard a professional driver who routinely hauls horses interstate describe shipping fever as a numbers game: "You know that some horses are going to get it. That's just how it goes."

Well, that's just not good enough. We now have a pretty fair understanding of this disease process and, as a result, some ideas for minimizing the risk of it developing. However, it means making some changes to the way we transport horses.

There are several factors that contribute to the development of pleuropneumonia during long-distance transport in horses, including these:

- standing with the head raised for several hours
- impaired immune function within the lungs as a result of elevated blood cortisol levels
- inhalation of airway irritants and contaminants

Simply tying a horse so that he cannot lower his head below chest level for several hours dramatically increases the number of bacteria in the lower airways. These bacteria travel down into the lungs from the upper airways (nasal passages and throat). Ordinarily, these normal inhabitants of the horse's upper airways are efficiently cleared from the lower airways by a combination of (1) gravity, when the horse lowers his head to browse, and (2) the mucociliary escalator, an active clearance process in which millions of microscopic, fingerlike projections (cilia) in the lining of the trachea beat in rhythmic fashion, thereby moving debris up the trachea to the throat on a raft of mucus.

So, as you might imagine, keeping the horse's head above chest height for several hours also impairs the ability of the lower airways to *clear* these extra bacteria and other contaminants (e.g. inhaled dust, fungal spores, upper airway secretions) from the lungs, as the material must be moved "up-hill," against gravity. As a result, bacteria that travel down into the lungs from the upper airway accumulate and multiply in the lungs if the horse must continue to stand with his head above chest height (which is inevitable if truck/trailer design or the way the horse is tied prevents him from lowering his head).

To add insult to injury, elevated cortisol levels during long-distance transport impair immune function within the lung. Certain cellular components of the immune response are suppressed for at least 36 hours after long-distance transport, leaving the horse more susceptible to bacterial and viral infections. So, not only are there more bacteria in the lungs, but the lungs are less able to deal with them.

The longer the horse stands with his head above chest height, the greater the impact of impaired immune function, increased bacterial numbers in the lower airways, and decreased airway clearance—in other words, the greater the risk for pleuropneumonia developing. Studies investigating the timing of these various events indicate that bacterial numbers in the lower airways become significant after 6–8 hours of standing with the head raised and continue to increase the longer the horse stands with his head up.

So, my recommendation for long trips is to limit travel to 8 hours per day. Take whatever rest stops you need during that time, but end your day after 8 hours on the road, unload the horse, and let him eat and drink at ground level and rest overnight before continuing

on. If you think that adds too much to the expense of the trip, then weigh that modest cost against the cost of veterinary care for a sick horse—or worse: a laminitic horse!

If you must drive straight through on trips lasting considerably longer than 8 hours, then ensure that the horse can get his head down in the truck or trailer compartment during travel. Ideally, leave him untied so that he can find his balance and lower his head as he likes. (There has even been a study which showed that cortisol levels are lower during transport when horses are allowed to travel untied than when cross-tied.) Also, make your rest stops as long as possible (hours rather than minutes) and offer food and water *at ground level* whenever you stop for a rest, as well as when you reach your destination. These measures are a poor substitute for limiting the duration of travel per day and letting the horse get his head down for several hours, though.

It is also worth adding that treatment with penicillin or other antibiotics before or during shipping does not necessarily protect the horse from pleuropneumonia. (There have also been studies in horses which address this issue.) There is simply no substitute for good basic management, as dictated by the horse's anatomy, physiology, and normal habits (i.e. *head down* for most of the day).

And while we're on the subject of respiratory health, I'm not a fan of having hay nets in the horse's compartment during travel, particularly if the horse is tied rather than loose. Having hay hanging so close to the face means that the horse is unavoidably inhaling dust and other fine particles, no matter how good the hay. Depending on the truck or trailer design, this problem can be considerably exacerbated by turbulent air flow in the horse's compartment from open windows or vents. Bedding the floor with shavings or sawdust can likewise increase the amount of fine particles in the horse's air space.

Having hay hanging so close to the horse's nostrils increases the amount of debris the lower airways must clear. This extra load further burdens a clearance mechanism that is already compromised by the horse's posture during travel. And if the horse has small airway inflammatory disease (SAID), inhaling all that debris can worsen lung function and adversely affect athletic performance. (SAID is a very common condition in stabled horses. It often goes undiagnosed, however, because the symptoms are not severe, e.g. occasional cough during exercise, mild reduction in exercise capacity.)

This practice of providing hay in the horse's compartment during travel also increases the risk for choke (esophageal obstruction), eye injuries, and leg injuries (or worse) if the horse gets a foot caught in the net. For these reasons, I typically recommend that horses not be given hay while traveling. They can be offered hay and water when you stop, but in most circumstances I'd rather hay not be within the horse's reach while the vehicle is moving.

In addition to providing food and water at ground level and letting the horse rest and recover following a long trip, keep watch for the signs of pleuropneumonia. They are listed in the accompanying box. The early signs usually are subtle (lethargy, picky appetite, mild elevation in body temperature) and often are overlooked or mistaken for simply being tired or stressed from travel. Some of these signs may first appear during the journey on really long trips, but in most cases they are first noticed 12–24 hours after arrival. If the pneumonia is progressing slowly, it may be 4 or 5 days before the horse looks really sick, so it's a good idea to take the horse's temperature twice a day for the first several days after a long trip and call your veterinarian if the temperature starts to

rise. (Depending on weather conditions, the rectal temperature for a healthy horse at rest should be less than 101.5 °F.)

Signs of shipping fever (bacterial pleuropneumonia) in horses

Keep an eye out for any of the following symptoms after a long trip:

lethargy, depression—mild at first, worsens as the disease progresses

disinterest in food—at first the horse may just leave some food, but as the infection worsens the horse may go off feed completely

fever—usually over 102 F, sometimes over 104 F; may be only slightly elevated at first, and may even be normal if the horse has been given phenylbutazone ("bute"), flunixin (Banamine), or a similar drug for any reason

increased respiratory rate—mild at first, but becomes more obvious as the disease progresses and lung function deteriorates

abnormal breathing pattern—as the disease worsens, breathing is labored, but the horse takes shallow breaths, often with the nostrils flared; in some cases the horse stands with her elbows held out

stiffness—usually because of chest pain and general malaise (feeling bad), but may also be due to laminitis ("founder"), which is a common complication of pleuropneumonia

colic-like discomfort and restlessness—not seen in every case, it is likely due to chest pain or the onset of laminitis

nasal discharge—uncommon and usually slight when present; a foul odor to the breath is a bad sign

coughing—uncommon; when present, the cough tends to be soft and "wet" sounding; coughing is painful, so the horse tries to suppress the cough

Adaptogenic herbs again

In the other article I discussed adaptogenic herbs as an aid to minimizing the impact of stress on a horse's health and performance. Some of the primary effects of these herbs include moderating the cortisol response to stress and enhancing immune function (e.g. increase the numbers and potency of white blood cells). For these two reasons alone, these herbs are potentially of great benefit to horses during long-distance transport.

So far, only one scientific study has been published on the effect of adaptogenic herbs during long-distance transport in horses. That particular study showed no overall effect, but the data from all of the horses were pooled, or combined, for analysis. I suspect that if the data from each individual horse were evaluated separately, they would have shown a significant and positive effect in some horses and minimal effect in others. That's because each body is unique and stress is a highly individual thing; what stresses me may not unduly stress you, and what really stresses some horses appears not to stress others so much. By pooling the data from all of the horses, any positive effect in individual horses would have been diluted or swamped completely, leaving us with the mistaken conclusion that there was no effect in any horse.

My favorite adaptogen product for horses is APF by Auburn Labs (www.auburnlabs.com). This company now has a number of anecdotal reports from professional horsemen attesting to the value of this supplement in elite performance

horses who compete and travel frequently and often travel long distances. My experience with adaptogenic herbs has been very positive and I, too, believe that this product has value in horses under stress, including transport stress. We simply lack the laboratory evidence at this time which confirms what practical use has indicated is the case.

And on that note, I'll wish you safe travels and happy trails!

Copyright ©2006 Christine King BVSc, MACVSc, MVetClinStud

This article was first published in Horses Incorporated (www.horsesinc.net).