Equine Herpesvirus (EHV) Myeloencephalopathy

A Guide To Understanding the Neurologic Form of EHV Infection

What is EHM?

Equine herpesvirus myeloencephalopathy (EHM) is another name for the neurologic disease associated with equine herpesvirus (EHV) infections. Neurological signs appear as a result of damage to blood vessels in the brain and spinal cord associated with EHV infection. Interference with the blood supply leads to tissue damage and a subsequent loss in normal function of areas in the brain and spinal cord.

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What are the equine herpesviruses?

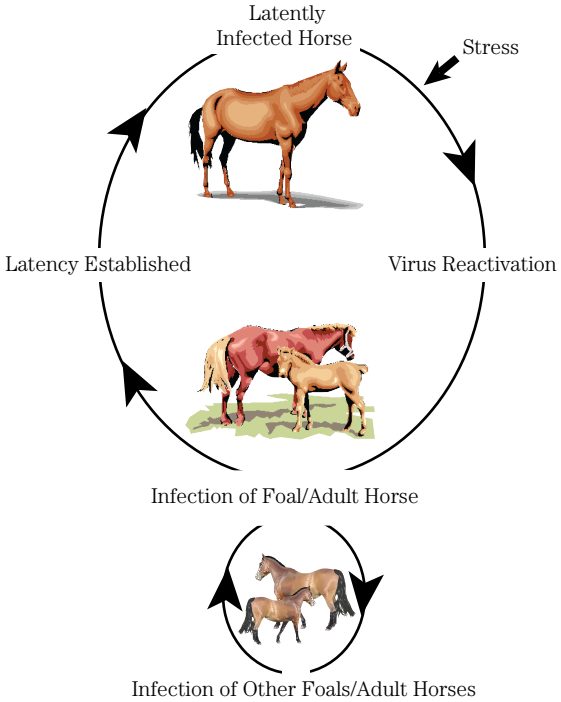
To date, nine EHVs have been identified worldwide. Three of these—EHV-1, EHV-3, and EHV-4—pose the most serious health risks for domesticated horses and can have significant economic impacts on the U.S. equine industry.

- **EHV-1:** Can cause four manifestations of disease in horses, including a neurological form, respiratory disease, abortion, and neonatal death. EHM is most often due to mutant or neuropathogenic strains of EHV-1, so called because of a particular mutation in the genome.
- **EHV-3:** Causes a venereal disease called equine coital exanthema that affects the external genitalia.
- **EHV-4:** Causes a nonfatal upper respiratory tract disease in foals and is uncommonly associated with abortion and rarely with neurologic disease.

How common are EHV-1 infections?

By 2 years of age, almost all horses have been infected with EHV-1. The initial exposure generally occurs in foals from contact with their dams. The virus can then become latent, or inactive, in the horse's body, setting up a carrier state that is life-long. Horses of any age that are carriers of EHV-1 do not show any external signs of disease when the virus is in a latent form. The virus can be reactivated during times of stress, such as strenuous exercise, long-distance transport, or at weaning.

Transmission of EHV-1



The transmission of EHV-1 occurs after an exposure to an adult horse or foal with an active EHV-1 viral infection. This exposure generally occurs via respiratory shedding of the virus. The infected adult horse or foal may or may not be exhibiting clinical signs of disease.

Why should I be concerned about EHV-1?

EHV-1 is the primary cause of EHM. In recent years, there has been a marked increase in the number of EHV-1 cases, especially EHM, reported in the United States. There have also been several outbreaks of EHM at large horse facilities and events—at racetracks, horse show grounds, veterinary clinics, and boarding stables. The large number of horses that can be exposed on such premises and the serious nature of the disease have caused significant concern within the animal health community and the U.S. horse industry.

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Furthermore, these recent occurrences of EHM appear to meet the criteria of an emerging disease. A disease is considered to be "emerging" when it satisfies at least one of three criteria:

1. The disease is identified for the first time in a region or country;
2. A disease changes in severity, type of animal that can be infected, or other changes in pathogen behavior; or
3. There is a change in geographic range of a disease or in its incidence within a range.

EHM likely meets the second criterion of an emerging disease, as the recent EHV-1 outbreaks seem to be associated with a change in the severity and behavior of the virus. It is possible that the reporting of EHV-1 cases has increased, rather than an actual increase in the number and severity of cases; however, more data are needed to make such a distinction.

How is the virus spread?

The most common way for EHV-1 to spread is by direct horse-to-horse contact. This virus is shed from infected horses via the respiratory tract or through direct or indirect contact with an infected aborted fetus and fetal membranes. Horses may appear to be perfectly healthy yet spread the virus via the secretions from their nostrils.

It is important to realize that EHV-1 can also be spread indirectly through contact with physical objects contaminated with infectious virus. Examples of such objects include:

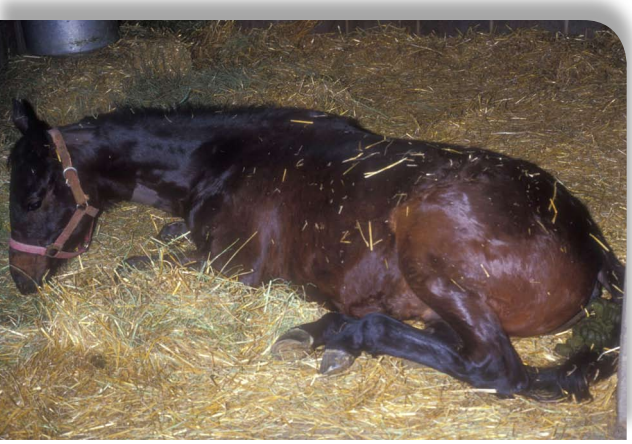
- Tack,
- Wipe rags or other grooming equipment,
- Feed and water buckets, and
- People's hands or clothing.

The air around a horse that is shedding the virus can also be contaminated with infectious virus. Although we know that the virus can become airborne, it is difficult to establish the distance the virus can spread in this manner under typical horse management and environmental conditions.

When should I suspect my horse might have EHM?

Signs of EHM include:

- Fever preceding neurologic signs (either in a horse diagnosed with EHM or in horses that have been exposed to a horse diagnosed with EHM),
- Decreased coordination,
- Urine dribbling,
- Loss of tail tone,
- Hind limb weakness,
- Leaning against a wall or fence to maintain balance,
- Lethargy, and
- Inability to rise.



Horses may appear to be perfectly healthy yet spread the virus via the secretions from their nostrils.

How is the disease diagnosed?

Diagnostics your veterinarian might perform for a live horse include:

- Nasal swab collection for laboratory examination and detection of virus by polymerase chain reaction (PCR) assay or by virus isolation; and
- Blood collection to detect the virus by PCR assay or by virus isolation. Blood samples should be collected 2 to 3 weeks apart for levels of antibodies specific to EHV-1.

Ideally, your veterinarian will collect both nasal swab and blood samples to optimize arriving at a diagnosis.

Diagnostics your veterinarian might perform for a deceased horse include:

- Necropsy examination of a horse with neurologic disease that dies or has to be euthanized, or necropsy examination of an aborted fetus/fetal membranes. Necropsy provides an important means of confirming the presence of EHV-1 disease.

Is there a treatment for EHM?

The standard form of care for EHM is primarily supportive. Treatments may include intravenous fluids or anti-inflammatory drugs. Antibiotics may be used to treat a secondary bacterial infection if one develops; however, antibiotics have no effect on the equine herpesvirus itself. Antiviral drugs have also been used to treat EHM cases. Research on the efficacy of these drugs, their cost effectiveness, and the optimal dosing regimen for EHM is still underway.

How can I prevent EHV-1, the primary cause of EHM, from spreading to other horses?

There are many steps you can take to help prevent the spread of EHV-1.

- Stop horse movement if your animals may be infected with EHV-1. This is the most important first step horse owners can take. Horses should neither enter nor leave a premises where EHM has been diagnosed until cleared by the veterinarian.
- Do not allow horses exposed to EHM case(s) to have contact with unexposed horses on the premises.
- Isolate sick horses. Horses that have aborted or shown signs of fever, respiratory disease, or neurologic disease should be separated from healthy horses. Ideally, the sick horse(s) should be moved into a separate building or paddock on the premises, or be transported to a veterinary hospital with an isolation facility.
- Do not share equipment among horses on the facility. Since this virus can be spread from horse to horse via contaminated objects such as water/feed buckets or bridles, equipment

should not be shared among horses.

- Practice proper biosecurity measures to prevent people from spreading the virus. Since people can transfer this virus from horse to horse via their hands and clothing, personnel should wash their hands after handling one horse and before handling another. They should also change their clothes and footwear after working with a sick horse. Optimally, a person who takes care of a sick horse should not work with healthy horses. When this is not practical, healthy horses should be handled first and sick horses last. Wearing gloves and using disinfectant to sanitize footwear can also help minimize the risk of people spreading the virus between animals.

Can I prevent EHM with vaccines?

Vaccines exist to control the respiratory and abortion manifestations of EHV-1; however, the currently licensed vaccines are not labeled for the prevention of EHM. University and private researchers are looking into several existing vaccines to determine if they protect against EHM. New vaccines for EHM are also being studied.

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Useful Resources

For more information related to EHV, EHM, and biosecurity, please refer to the following documents and Web sites:

- United States Department of Agriculture (USDA)
  USDA:APHIS:VS:CEAH. 2008. Equine Herpesvirus Myeloencephalopathy: Mitigation Experiences, Lessons Learned, and Future Needs. N#522.0708. http://www.aphis.usda.gov/vs/nahss/equine/
- USDA:APHIS:VS:CEAH:CEI. Emerging Animal Disease Notice. 2007. Equine Herpes Virus Myeloencephalopathy: A Potentially Emerging Disease. http://www.aphis.usda.gov/vs/ceah/cei/taf/emerging diseasenotice.files/ehv.pdf
- USDA:APHIS. Biosecurity—the Key to Keeping Your Horses Healthy. http://www.aphis.usda.gov/publications/animal_health/content/printable_version/HorseBioSecurity_final.pdf

- University of California Center for Equine Health (CEH)
  http://www.vetmed.ucdavis.edu/ceh/topics.htm
- American Association of Equine Practitioners (AAEP)
  http://www.aaep.org/control_guidelines_non-member.htm
  http://www.aaep.org/vaccination_guidelines.htm
- Iowa State University Biological Risk Management (BRM)
  http://www.cfsph.iastate.edu/BRM/equineresources.htm
  http://www.cfsph.iastate.edu/BRM/disinfects.htm

For More Information

To find out more about EHM, please contact:

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