# The Perfect Viral Storm

## EQUINE HERPES VIRUS

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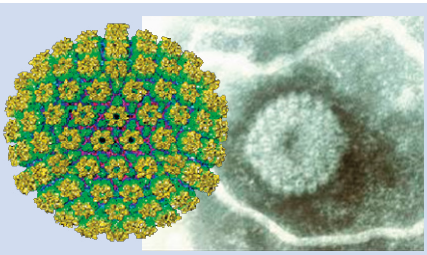
Her clinical interests include diagnostic imaging, the investigation and management of musculoskeletal issues in the equine athlete, the equine foot, neonatology and internal medicine.



*Images of the EHV virus are courtesy of Dr Richard L'Estrange*

There has been a recent outbreak in Europe of a neurological form of equine herpes virus – Equine Herpesvirus-associated Myeloencephalopathy (EHM).

The initial cases were in Valencia, Spain, but cases have now been reported in Germany, Belgium, France, Sweden, Italy, UK and Qatar. The outbreak has been described as the most serious EHV-1 outbreak in Europe for decades, and essentially a "perfect storm". Horses travelled to an event from many locations and were housed in close proximity to each other after arrival, allowing rapid spread. Outbreaks of EHV-1 neurological disease can affect large numbers of horses when conditions favour spread of the virus, such as in the USA at the National Cutting Horse Championships in 2011. Unfortunately, there have been many horses seriously affected and a number of deaths. The level of veterinary care required for affected horses is very intense, as often these horses cannot stand or walk unassisted. Spread of this infection from the site of the initial outbreak appears to be associated with transportation of horses that were infected at the event, either while they were in the incubation period, or after they showed signs of illness.

There is much coordination between the FEI, the different equestrian European regulatory bodies, veterinarians and epidemiologists in attempting to limit further spread and transmission of the virus.

There have also been cases recently reported in Florida, USA. Here in Australia, outbreaks and sporadic cases of EHM have occurred over the years, and given the current outbreak overseas, it is imperative that owners have some knowledge of the disease.

## What is Equine Herpes Virus?

Herpesviruses are DNA viruses and are pathogens affecting most mammals – different types affect different species.

Equine Herpes Virus (EHV) is a contagious viral disease. There are nine different equine herpes viruses with EHV-1 and EHV-4 being the most commonly seen causing disease in horses. Infection with EHV-1 or EHV-4 is one of the most common causes of viral respiratory disease worldwide and EHV-1 is the most common viral cause of abortion in horses across the world.

## What are the different types that cause disease in horses?

### EHV-1

Causes five manifestations of disease:

1. Respiratory disease
2. Abortion – can result in abortion storms/epidemics
3. Neonatal death
4. Neurological disease – EHM
5. Chorioretinopathy – lesions in the retina of the eye

A horse in Valencia, Spain with the neurological manifestation of EHV, known as Equine Herpesvirus-associated Myeloencephalopathy (EHM).
Photo courtesy of Dr Ana Velloso Alvarez.

## EHV-2

Does not usually cause disease on its own but is believed to cause suppression of the horse's immunity to other viral and bacterial respiratory infections.

## EHV-3

This causes 'coital exanthema' which is an infection of the external genital regions – the vulva in the mare and the penis and scrotum in stallions. The infection is characterised by numerous small blisters and is sometimes called 'the pox'. The blisters can burst and become secondarily infected by skin bacteria. The disease is spread venereally from a carrier mare to stallions and then onto other mares. It doesn't have a direct effect on fertility, but natural covering must be stopped to allow healing and to limit spread.

## EHV-4

This is a common cause of respiratory disease and loss of performance in young horses especially racehorses. The respiratory disease is often not severe, but does result in economic losses due to the disruption of training programmes. It may also cause sporadic abortion in pregnant mares.

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## Main Clinical Manifestations of EHV-1 & EHV-4

### 1. Respiratory disease

Typically affects the upper respiratory tract and the clinical signs are similar for EHV-1 and EHV-4. The signs can vary from asymptomatic, mild to severe. The signs may last for two to three weeks. They include depression, inappetence, dullness, high temperatures, coughing, enlargement of the lymph nodes around the head, nasal discharge, discharge from the eyes, and on occasion swollen legs. Sometimes secondary bacterial infections can occur in the lower respiratory tract.

Clinical signs are often more severe in younger horses compared to older horses. Older horses can also transmit the virus to younger horses without showing signs of infection.

### 2. Abortion

Mainly caused by EHV-1, but on occasion can be EHV-4. Infection occurs via the respiratory tract and the virus travels through the bloodstream to infect the cells lining the blood vessels supplying the placenta. The abortions usually occur late in the pregnancy in the last trimester. Mares often appear healthy but abort two weeks to months after infection with the virus. The abortion often occurs without warning – the placenta is often found with the foetus. Sporadic abortions in individual mares are most common, but outbreaks (abortion storms) may occur in a group of mares. Mares typically recover and carry a healthy foal in the next breeding season with future reproductive ability unaffected.

### 3. Neonatal death

On some occasions foals are born alive – sometimes they appear healthy and deteriorate in the first 48 hours and others are born very sick. The clinical signs are failure to nurse, high temperature, weakness, respiratory distress and diarrhoea. Sadly, these foals do not respond well to treatment and often die or have to be euthanised.

### 4. Neurological disease

The neurological manifestation is known as Equine Herpesvirus-associated Myeloencephalopathy (EHM). The neurological form is caused by EHV-1 affecting the central nervous system. Outbreaks are characterised by a large number of horses affected with mild to moderate respiratory disease and high temperatures, 10 – 50% of infected horses develop EHM.

The neurological form occurs as a result of the virus circulating in the bloodstream and the virus can then infect the cells lining the blood vessels supplying the brain or spinal cord. As a result, localised inflammation, clots and haemorrhage occur within the central nervous system (the brain and the spinal cord) at the site of infection.

Initial signs are a high temperature and the associated dullness and inappetence. The neurologic signs that occur depend on the location within the central nervous system, number and size of these lesions. Typical signs include lethargy, ataxia (wobbliness), dysmetria (lack of coordination), weakness, paralysis and difficulty urinating. The onset of signs is relatively acute and they progress rapidly, but improvement can take weeks to months. A recumbent horse results in many other problems including organ failure, secondary infection and muscle issues. They require intensive veterinary support. Sadly, some have to be euthanised on welfare grounds.

## How is the disease spread?

EHV is a contagious viral disease spread via direct horse to horse contact (for example horses touching noses) and also via aerosol droplets over short distances (up to five metres) by snorting and coughing – this can result in rapid spread through a group of horses. It can also be spread by droplets on equipment such as tack, feed and water buckets, grooming equipment and people via their hands and clothing. Horse transport is also a risk for disease transmission as they become contaminated when infected horses are travelled.

A foal that was aborted due to the mare having Equine Herpes Virus.
Photo courtesy of Dr Joan Carrick.

"Initial signs are a high temperature and the associated dullness and inappetence."

When mares abort due to EHV, the foal, placenta and associated fluids are all sources of possible infection.

Infected horses become life-long latent carriers, as EHV remains dormant (or latent) in horses following their first infection. This means that they can carry the virus without showing any signs of disease, and can reactivate and become infectious following a period of stress, such as travelling or attending a competition. The horse can shed the virus and infect others, but may not always show the clinical signs themselves.

## How is EHV Diagnosed?

A presumptive diagnosis is made on the basis of clinical signs and known outbreaks. Laboratory testing confirms diagnosis. The laboratory tests that may be used are virus isolation, polymerase chain reaction (PCR) and serological analysis (monitoring antibody response). Samples that may be taken are blood tests, nasal swabs, and in the case of abortions foetal and placental tissues.

## What is the Treatment for EHV?

Symptomatic treatment is the mainstay of treating the respiratory disease caused by EHV-1 and EHV-4. The disease is often self-limiting, but secondary complications may occur and need to be monitored for. Nonsteroidal anti-inflammatory drugs and antibiotics may be used where necessary.

With abortions, it is essential that the mare is checked for retained foetal membranes and uterine flushing, nonsteroidal anti-inflammatory drugs and antibiotics may be used if necessary.

In EHM (neurological) cases the treatment is supportive and may include non-steroidal anti-inflammatory drugs, corticosteroids, vitamin E and intravenous fluids. Virustatic drugs (limit virus replication) may be considered by some veterinarians.

The recumbent horse requires very intensive management with the use of slings and regular catheterising of the bladder in combination with fluid therapy and sedation. The management may be prolonged.

## Prevention

### Early Recognition and Limiting Spread

Once a case or outbreak has been identified then there are certain key measures that are initiated to limit further spread. Your veterinarian will be

a key player in assisting in making these recommendations. These measures include:

- **Isolate/quarantine**
  Any suspect case or horses that may have been in contact with an infective case should be kept away from other horses.
- **Biosecurity**
  Each horse should have dedicated equipment to feed, clean and work with. Rigorous hygiene measures should be initiated with the use of protective gowns or overalls, head covers, masks, boot covers and disposable gloves. Good hand sanitation is vital. Isolation should be for at least 21 days.

"The onset of signs is relatively acute and they progress rapidly."

## Vaccination

There is a vaccination available for EHV-1 and 4. This vaccine has been shown to be beneficial in reducing the severity of respiratory disease and the amount of virus shed in nasal secretions. Vaccination also reduces the likelihood of EHV-1 abortion. There is no vaccine that claims to protect the horse against the neurological form. The vaccine should be considered for competition horses and broodmares, but your veterinarian will be able to advise you further on the use of the vaccine in your circumstance.


Photo courtesy of Dr Richard L'Estrange

## Summary

There is currently an outbreak of the neurological form of EHV-1 in Europe which has been described as the worst outbreak in decades. There are several different equine herpes viruses that cause disease in horses. EHV-1 and EHV-4 are the main ones of concern for disease in the horse. Key control measures are stringent isolation and biosecurity of cases to limit spread, but biosecurity practices that limit mingling of horses from different properties or areas at events will also limit spread of infection. Practices that reduce stress are likely to reduce the likelihood of reactivation, which in turn reduces risk of infection of new horses. There is a vaccine that may be beneficial for some horses. Your veterinarian will have up to date information on any local outbreaks. There is also much information on the FEI website.

A horse being treated for Equine Herpes Virus in an equine hospital in Belgium in the current outbreak.
Image courtesy of Dr Katleen Vanschandevijl.