

The Hendra vaccine: your questions answered



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How effective is the Hendra vaccine? Will the vaccine affect my horse's performance? Can I still export my horse if he has been vaccinated? Is the vaccine safe to use on pregnant broodmares and youngstock? How much should it cost?

All your Hendra vaccine questions answered here...

With special thanks to the EVA Hendra virus sub-committee:
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What is Hendra?

Hendra virus in horses causes a rapidly progressive and usually fatal, respiratory and/or neurological disease. It was first discovered in September 1994 during an outbreak that resulted in the deaths of twenty horses and a horse trainer, and sickness in a stable hand in the Brisbane suburb of Hendra, Queensland.

Hendra causes sporadic infections in horses and is a rare disease in humans. It is regarded by human and animal health, and workplace health and safety authorities, as a low incidence but high consequence disease because it is one of the most lethal viruses known, with no registered cure, and one which requires very careful risk management.

There have been seven confirmed cases of Hendra infection in humans, and four people have died after being infected with the virus. Hendra has an acute case fatality rate of approximately 75% in horses and 60% in humans and has the ability to infect multiple animal species. There have been two recorded cases of infection in dogs which were subsequently euthanased. These dogs were suspected of having been infected by contact with infected horses. Horses which recover from natural infection may also need to be euthanased.

To date (June 2019), 62 outbreaks of Hendra disease resulting in the death or euthanasia of 104 horses have been reported in Queensland and New South Wales, with cases occurring as far south as Scone, NSW Hunter Valley and as far west as Chinchilla, QLD. In January 2013, Hendra virus genetic material was detected in a flying fox in South Australia.

It is possible that other horse deaths due to Hendra may have occurred and been misdiagnosed or not investigated and recorded.

How is Hendra spread?

Hendra virus occurs naturally in all four mainland species of flying foxes (fruit bats). The transmission route to horses is incompletely understood but the virus can be transmitted to horses when the bats shed the virus from their body fluids and excretions. The virus has been detected in the blood, urine, faeces, placental material, aborted foetuses and birthing fluids of flying foxes. Recent research indicates that the urine from infected bats is the most common source of transmission to horses. Outbreaks to date have occurred within the range of the black flying fox and the spectacled flying fox species.

Hendra virus can potentially spread from horse to horse through direct contact with infectious body fluids or indirect contact via contaminated equipment that could transfer infectious body fluids from one horse to another.

The virus is zoonotic, meaning that it can then pass from an infected animal, in this case the horse, to humans through close contact with the horse's saliva, mucous, blood, urine, faeces, or tissues. The virus is not highly contagious and transmission of infection to humans can occur by close contact with an infected, sick or dying horse, however it is very important to note that horses can be infectious for up to 72 hours prior to showing any clinical signs.

What are the symptoms?

If you have a horse, that displays any of the signs listed below, always keep your own safety in mind. Follow guidelines outlined by Government animal biosecurity, workplace health and safety, and health authorities including, contacting your veterinarian immediately, isolating the horse, using personal protective equipment including a face mask, goggles and gloves, and always remember to wash your hands thoroughly with soap and water after handling any sick horse.

Common clinical signs in horses include any one or combination of the following:

- Acute onset of illness
- Increased body temperature
- Increased heart rate
- Discomfort or weight shifting
- Depression
- Rapid deterioration

One of the dangers with Hendra is that clinical signs can initially be so vague or mild that cases have been mistaken for other conditions, such as colic and snakebite. By the time you realise you are dealing with a Hendra case, human exposure may have already occurred.

How can I reduce the risk of my horse contracting Hendra?

Vaccinating your horse with the Hendra vaccine is regarded by veterinarians, as well as by Government animal biosecurity, workplace health and safety, and health authorities, as the single most effective way of reducing the risk of Hendra virus infection. Talk to your veterinarian now about your individual situation and the risk posed by Hendra virus to your horses, and about reducing the risk by vaccinating your horse.

Additional measures include:

- Removing horse feed and water containers from under trees. If possible, place feed and water containers under a shelter.
- Removing your horses from paddocks where flowering or fruiting trees may be attracting flying foxes. Return the horses only after the trees have stopped flowering or fruiting and the flying foxes have gone. If the horses cannot be removed from the paddock, consider fencing (temporary or permanent) to restrict access to trees. Clean up any fruit debris underneath the trees before returning the horses. If it is not possible to remove your horses from paddocks for long periods, try to temporarily remove your horses during times of peak flying fox activity (usually at dusk and during the night).
- Cleaning and disinfecting gear exposed to any body fluids from horses before using it on another horse. This includes items like halters, lead ropes and twitches. Talk to your veterinarian about which cleaning agents and disinfectants to use.
- When cleaning contaminated equipment, always wear gloves, cover any cuts or grazes and wash your hands thoroughly afterwards.
- If your horse becomes sick, isolate it from other horses, other animals and people until a veterinarian's opinion is obtained.
- Always handling healthy horses before handling sick horses. Only handle sick horses after taking appropriate precautions.
- Practise good biosecurity (animal disease control). Do not travel with, work on or take sick horses to other properties or equestrian events.
- Do not allow visiting horse practitioners (e.g. farriers) to work on sick horses.
- Seeking veterinary advice before bringing any sick horse onto your property.

Always remember that fruit bats have been known to travel up to 100 km from their colony at night to feed, so you might not be aware of bat activity on your property.

The Hendra vaccine

The Hendra vaccine reduces the risk of Hendra infection in healthy horses from four months of age by stimulating a protective immune response.

Horses are initially vaccinated with two doses, 21 to 42 days apart, with protective immunity normally occurring 14-21 days after the second dose.

The vaccine contains a non-infectious protein component from the outer surface of the virus, plus what is known as an adjuvant.

The Hendra vaccine is fully registered by the Australian Government Veterinary Medicines Authority (APVMA). The product should not be used in sick or immunocompromised horses. Details of product label can be viewed at <https://apvma.gov.au/node/12876>.

Development and rigorous testing of the vaccine has been the result of many years of cutting edge scientific research and collaborative efforts between leading scientists in the United States, the CSIRO Australian Animal Health Laboratory, and the manufacturer. The vaccine's development has received international and Australian scientific accolades.

How does the vaccine work?

The vaccine stimulates the immune system to produce protective antibodies and to recognise a future challenge with the virus.

If the horse is subsequently exposed to Hendra, the antibodies will bind with and neutralise the viral particles, preventing them from establishing active infection in the horse.

Viral particles bound to antibody are then further eliminated by responses from an activated immune system

How effective is the vaccine?

Clinical trials conducted at the CSIRO Australian Animal Health Laboratory (Middleton et al 2014, Broder et al 2016) have shown complete protection when vaccinated horses were exposed to a lethal dose of Hendra virus administered directly into the nose and mouth. The dose used was much higher than the levels of exposure which would occur from flying foxes shedding virus in the field.

There was no evidence that infection had been established in the vaccinated horses or that infectious virus was shed from any of these horses.

The CSIRO trials show that vaccination will be an extremely effective aid in minimising the risk of Hendra disease in horses and in preventing the risk of Hendra transmission from horse to horse, and from horse to human.

How do I know if my horse should be vaccinated?

You should discuss the suitability of vaccination of your horse, your individual situation and the risk posed by Hendra virus with your veterinarian.

From a public health and equine health point of view, it is strongly recommended that horses are vaccinated against Hendra in the high risk areas of Queensland and New South Wales.

Horse owners in other areas need to take into account the movement of their horse, interactions with other horses from high risk areas, local flying fox roost populations, flying fox movements to local attractive food sources, and the potential for interaction of the two species when deciding whether they should vaccinate.

Is my horse guaranteed protection against Hendra if I choose to vaccinate?

As with all vaccinations for diseases in both humans and animals, protection cannot be guaranteed by vaccination, however CSIRO trials have shown complete protection from the development of clinical signs and disease in vaccinated horses (Middleton et al 2014, Broder et al 2016). There have been no recorded cases of Hendra infection in vaccinated horses since vaccination began in November 2012.

An animal's ability to respond to vaccination can vary and it is often reduced when the animal is stressed or unwell, or its immune system is compromised.

Vigilance is still important. Vaccination is not a replacement for good biosecurity practices including hand hygiene, minimisation of contact with the horse's bodily fluids, and extreme caution when handling sick horses.

How much will it cost to vaccinate my horse?

Pricing will vary between veterinarians and will depend on the number of horses being vaccinated, and the location.

On average, the cost of the full course of vaccinations for the first year of protection is less than a dollar per day, and around 50c per day in subsequent years. This is roughly equivalent to the cost of two shoeings.

Administering the vaccine

How is the vaccine administered?

The vaccine is administered via intramuscular injection into the side of the neck.

Two 1ml doses must be given between 21 and 42 days apart to complete the primary course.

This is followed by a booster at 6 months, and the APVMA has approved an annual booster thereafter on the label because there was sufficient data for the APVMA to conclude that the duration of immunity lasted 12 months.

Does my horse need to be microchipped?

The AVA and EVA recommend that all vaccinated horses are microchipped, to ensure correct identification on the vaccine registry.

If your horse is already microchipped, it will not require a second chip.

Why can't I administer the vaccine myself?

The Equivac® HeV vaccine must only be administered by accredited veterinarians according to the vaccine's manufacturer. This is to ensure that the vaccine is handled and stored correctly, that the precautions and contraindications on the product label are adhered to, and that the requirements of the registry are upheld.

Due to the horse and human health benefits of this vaccine, and the importance of maintaining the integrity of vaccine use and the registry the AVA and the EVA strongly recommend that the vaccine should only be available to veterinarians.

Safety concerns

Is the vaccine safe?

Yes. The Hendra vaccine is not likely to have an unintended effect that is harmful to horses as long as the label directions are followed and is highly effective in minimising the risk of Hendra infection. The potential for a vaccinated horse to pass on the Hendra virus can never be ruled out with a 100% certainty. As a precaution, it is recommended people take the same steps to protect vaccinated horses from exposure to infection and to prevent humans being infected by horses as are recommended for unvaccinated horses. Personal protective equipment should be worn whenever infection is suspected even in vaccinated horses.

Safety studies have been conducted in horses greater than 4 months of age and in pregnant mares, and these studies have shown the vaccine is not likely to have an unintended effect that is harmful to horses.

The majority of horses show no signs after vaccination. The most common side effects that have been reported have included small injection site reactions, lethargy, slightly elevated temperature, stiffness, or temporarily off-feed. These symptoms are generally all short-lived and are typical of many vaccines. As with all vaccines, side effects may vary in severity and on some occasions may require veterinary intervention.

It is possible that vaccinating horses whose immune systems are compromised may result in a display of clinical signs associated with other conditions. The potential for interactions when administered with other vaccines is not known.

Occasionally booster shots for any vaccine may result in more severe reactions. When first exposed to an antigen (such as that present in a vaccine), cells in the body's immune system produce antibodies—this is how the vaccine works. In some individuals a particular type of antibody is produced in excess, which produces a marked response by immune cells the next time the body is exposed to the same antigen—such as a booster vaccine. In these individuals, the normal course of vaccination may lead to an exaggerated immune response to vaccination. This is known as a hypersensitivity reaction and each subsequent exposure can result in a similar or more severe reaction in the individual. It is important that people who observe adverse events report them to the veterinarian who administered the vaccine, the registration holder, &/or the APVMA.

From vaccine release in November 2012 to March 2017, 513,890 doses of the Hendra vaccine were administered. A probable plus possible adverse reaction total of 1,208 as determined by the APVMA, represents an adverse reaction rate of 0.23%. From the time of vaccine release to November 2017, 20 laboratory confirmed Hendra infections, all in non-Hendra vaccinated horses have occurred.

Can the vaccine cause Hendra infection?

No, the vaccine is not a live vaccine and it cannot cause clinical disease. Live virus is not used at any stage in the production of the vaccine.

The Hendra vaccine is known as a "subunit" vaccine. Other "subunit" vaccines used in horses include the Strangles vaccine.

How will vaccinating my horse protect human life?

The only recognised pathway of transmission of Hendra virus to people is from contact with infected horses.

Vaccination of horses can therefore provide protection to people by interrupting Hendra transmission from flying foxes to horses, and then to humans. This is known as a One-Health approach to protecting horse, human and environmental health.

Can vaccination affect my horse's performance?

In line with other vaccination recommendations, it is wise to avoid administering the Hendra vaccine within seven days of competition in case mild temporary side effects.

Is the vaccine safe for use in foals?

Yes, the Hendra vaccine is not likely to have an unintended effect that is harmful to foals vaccinated from 4 months of age with two doses, between 21 and 42 days apart.

Thoroughbred foals to be registered with the Australian Stud Book must only be microchipped with an ASB assigned microchip.

Is the vaccine safe for use in pregnant broodmares?

Yes, the APVMA announced in January 2016 that the Hendra vaccine is not likely to have an unintended effect that is harmful to pregnant broodmares.

As general advice, it is important to avoid the use of vaccines during critical stages of pregnancy. For this reason avoid vaccinating during the first 45 days after mating and the last 14 days before the expected date of foaling.

When vaccinating foals born to mares vaccinated with the Hendra vaccine, it is recommended that the foal's primary vaccination course be delayed until 6 months of age to ensure an effective immune response to the vaccine.

There is strong evidence confirming safe use in broodmares, with no untoward effects on foals born from those mares, from some of the largest Australian studs in the Hunter Valley which instituted vaccination policies for their broodmares before the foaling season.

Export restrictions

At present, vaccinated horses can be exported to most countries, including the major destinations of New Zealand, Hong Kong, Singapore, the United Arab Emirates, South Africa, the United Kingdom, the European Union, USA and Canada.

China and Malaysia have specific limitations regarding Hendra and the importation of horses.

The Commonwealth Government Department of Agriculture and Water Resources is in discussions with these countries regarding the approval of importation of vaccinated horses.

In the meantime, export of vaccinated horses will be managed on a case-by-case basis. Dispensation can be requested.

Is the vaccine compulsory?

Following biosecurity risk assessments, individual equestrian associations and industry bodies have introduced mandatory Hendra vaccination within their organisations, including the Royal Queensland Show ("the Ekka"), Samford Show Society (QLD), North Coast National A & I Society (NSW), and Pines River Show (QLD). Many private riding schools and agistment properties have also made vaccination a compulsory requirement.

Some event organisers or committees within Equestrian Australia (EA) may require mandatory Hendra vaccination of horses as a condition of entry following their specific biosecurity risk assessments. This follows from the Australian Competition and Consumer Commission (ACCC) publishing its findings in December 2015 where it considered that the likely public benefits conferred by a mandatory vaccination policy, which thereby reduced the risk of transmission of the Hendra virus to other horses or to humans, outweighed any public detriment.

The Queensland Racing Integrity Commission (QRIC) has announced that they are committed to promoting vaccination of horses against Hendra virus, as a health and welfare benefit.

Commonwealth and State Governments do not have mandatory Hendra vaccination requirements.

Contact your equestrian organisation directly to enquire about their policy on Hendra vaccination.

My horse has been vaccinated. Now what?

How can I prove that my horse has been vaccinated?

There are two ways that your horse's vaccination status can be verified;

1. Following completion of the vaccination course, a certificate will be emailed to you, and\
2. Your horse's vaccination status and microchip number will be recorded on the Vaccination Registry and accessible through www.health4horses.com.au

Who can access the vaccination data on the registry?

The date of every dose of the Hendra vaccine administered, along with the horse's microchip number, is recorded on the Vaccination Registry by the veterinarian who administers the vaccine. Only registered and accredited veterinarians can update any of the information listed on the Registry.

Other people or organisations wanting to look up the vaccination status of a particular horse can access this information by entering the horse's microchip number through www.health4horses.com.au

Is there a way to tell the difference between vaccinated and unvaccinated horses?

Vaccinated horses must be microchipped and their details entered into the national Vaccination Registry. A vaccination certificate will also be provided to the owner.

If there is any confusion about the vaccination status of a horse involved in a Hendra outbreak, or if the horse is to be exported, blood samples can be taken to help differentiate naturally infected horses from vaccinated horses, with reference to what is entered on the Vaccination Registry.

References

Middleton D, Pallister J, Klein R, Feng YR, Haining J, Arkinstall R, et al. 2014 Mar. "Hendra virus vaccine, a One Health approach to protecting horse, human, and environmental health." *Emerg Infect Dis* <http://dx.doi.org/10.3201/eid2003.131159>.

Broder CC, Weir DL, Reid PA. (2016) Hendra virus and Nipah virus animal vaccines. *Vaccine*;34: 3525–3534

The most effective way to minimise Hendra virus infection risk is through the vaccination of your horse.

Talk to your veterinarian about vaccination today.



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