

# Equine Vaccination Guide:

How to help prevent infectious disease through proper vaccination.





## You and your veterinarian: The first line of defense

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**Most every horse owner knows how to recognize a normal, fit and healthy horse.** The horse is bright, alert and energetic; has a nice hair coat; and has a good appetite.

**Horse owners also know that maintaining this healthy condition is no accident.** Your horse faces a variety of threats, including infectious diseases. This guide is designed to give you an overview of the causes of many health problems and steps you can take to help prevent them through vaccination.

**Fortunately, you have a partner to give you expert advice on your horse.** Your veterinarian brings you the combined benefits of medical knowledge, hands-on experience and the latest advances in products and technology specifically focused on keeping your horse healthy.

**Don't wait for an emergency to call your veterinarian.** Establish a partnership with him or her today. You'll have a far better chance of avoiding the problems described in this guide. And you'll have the essential knowledge and unbiased advice that will prove invaluable to both you and your horse.

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Fortunately, vaccination reactions are rare, and, if they do occur, they are generally mild and self-limiting. Serious reactions such as anaphylactic shock can be life-threatening. That's why it's wise to have your veterinarian administer vaccinations. He or she will be prepared to handle a reaction if one should occur.

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## The importance of immunization

**Equine infectious diseases can attack suddenly and be devastating to your horse** — lowering performance levels, causing significant illness and possibly even jeopardizing life. The key to a good infectious disease control program is a good vaccination program developed in conjunction with your veterinarian. Unfortunately, many horse owners may be unaware of the importance of immunization to help protect their horse from disease. Preventing a disease through proper vaccination programs is far safer, easier and more economical than treating the disease after the horse is already sick.

**Vaccination programs vary according to your horse's specific needs.** Variables include the horse's age, environment, risk of exposure to infectious agents, and geographic location. Your veterinarian can advise you about the individual requirements of your horse.

**If you own more than one horse, it's important that all horses be included in the vaccination program.** Just a single unprotected horse in a herd can provide a reservoir of infection to all others.

### Why vaccinate

1. Less expensive than treating a disease
2. Less time-consuming than treating a disease
3. Helps prevent mass outbreak of disease



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Many of the protocols and studies referenced here are courtesy of the AAEP.  
You can learn more at [aaep.org](http://aaep.org).

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## Core vaccinations

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The American Association of Equine Practitioners (AAEP) has created a category of vaccinations called core vaccinations. These are vaccines against diseases that:

- Are endemic to a region
- Are virulent/highly contagious
- Pose a risk of severe disease
- Have potential public health significance and/or are required by law

Core vaccines have clearly demonstrated efficacy and safety, with a high-enough level of patient benefit — and low-enough level of risk — to justify their use in all horses.

## Eastern/Western Encephalomyelitis (EEE/WEE)

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EEE and WEE are viral infections of the horse's brain and spinal cord. The virus is maintained in reservoirs (primarily birds and rodents) and transmitted to the horse by the bite of an infected mosquito.

Clinical signs can include:

- Behavioral changes
- Loss of appetite and fever

These can progress in 12 to 24 hours to:

- Dementia with head-pressing
- Teeth-grinding
- Circling
- Blindness
- Ataxia (incoordination)



### **The disease is fatal in 50-90 percent of cases.**

Surviving horses often have residual mental dullness. Treatment is generally supportive because antibiotics are ineffective.

There are two types of equine encephalomyelitis commonly seen in North America – EEE and WEE. A third type, Venezuelan (VEE), is seen in Central America and northern South America but has not been reported in the United States since 1971. EEE and WEE are considered core equine vaccines and are indicated in the immunization program for all horses.

## **Rabies**

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Rabies is an infrequently encountered neurologic disease.

**But while the incidence of rabies in horses is low, the fatality rate is high.** Because there is no treatment, rabies disease is invariably fatal and has considerable public health significance. AAEP recommends that rabies vaccine be a core vaccine for all horses.

Rabies can look like many diseases. Clinical signs vary widely and can include:

- Colic
- Lameness
- Ataxia (incoordination)
- Incontinence
- Muscle spasms
- Paralysis
- Blindness
- Depression
- Possible aggression

Exposure occurs through the bite of an infected (rabid) animal, typically a wildlife source such as raccoon, fox, skunk or bat. Bites to horses occur most often on the muzzle, face and lower limbs. The virus migrates via nerves to the brain, where it initiates rapidly progressive, invariably fatal encephalitis.

## Tetanus

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**All horses are at risk of developing tetanus, an often fatal disease** caused by a potent neurotoxin called *Clostridium tetani* (*Cl. tetani*). Tetanus toxoid is a core equine vaccine and is indicated in the immunization program for all horses.

Spores of *Cl. tetani* survive in the environment for many years, resulting in an ever-present risk of exposure to horses and people in equine facilities. Tetanus is not a contagious disease but is the result of *Cl. tetani* infection of puncture wounds (particularly those involving the foot or muscle), open lacerations, surgical incisions, exposed tissues such as the umbilicus of foals and reproductive tract of the postpartum mare (especially in the event of trauma or retained placenta).

Tetanus toxin affects the horse by causing:

- Rigid paralysis
- Spasms of the muscles (often the jaw muscles are affected first, hence the name “lockjaw”)
- Anxious expression
- Reaction to noises or movements with spasms or convulsions
- Respiratory paralysis and dehydration that can lead to death

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All horses, regardless of geography and lifestyle, should receive core vaccines as outlined by the AAEP.

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## West Nile Virus

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West Nile virus (WNV) is the leading cause of arbovirus encephalitis in horses and humans in the United States.

**According to AAEP Vaccination Guidelines, nearly 25,000 cases of equine WNV encephalitis have been reported in the United States since 1999.**

This virus has been identified in the entire continental United States, most of Canada and Mexico. The virus is transmitted from avian reservoir hosts by mosquitoes to horses, humans and a number of other mammals.

Clinical signs include:

- Ataxia (incoordination)
- Stumbling
- Loss of appetite
- Fever
- Muscle-twitching
- Partial paralysis
- Neurologic signs may include head-pressing, inability to stand up, convulsions and possibly death

**The case fatality rate for horses exhibiting clinical signs of WNV infection is approximately 33 percent.** According to AAEP, there is data showing that 40 percent of horses that survive the acute illness caused by WNV still exhibit residual effects, such as gait and behavioral abnormalities, six months post-diagnosis.



## Risk-based vaccinations

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According to the AAEP, risk-based vaccines are administered on the basis of a risk assessment performed by your veterinarian. Criteria can include your horse's age, exposure level and geography. Use of these vaccines may vary among individuals, populations and/or geographic regions.

### Influenza (EIV)

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**Equine influenza virus is one of the most common infectious diseases of the respiratory tract of horses.** It is endemic in the equine population of the United States and throughout much of the world. EIV does not constantly circulate, even in large groups of horses, but is sporadically introduced by an infected horse. Because EIV is considered the most economically important respiratory disease in the horse, all horses should be vaccinated against equine influenza unless they live in a closed and isolated facility.

EIV is highly contagious, and the virus spreads rapidly through groups of horses in aerosolized droplets dispersed by coughing.

Clinical signs include:

- Fever (102.5° to 106.5° F)
- Frequent dry cough
- Nasal discharge
- Lethargy
- Anorexia
- Possible secondary bacterial pneumonia





## **Equine Herpesvirus (EHV, also called Rhinopneumonitis or Rhino)**

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Equine herpesvirus type 1 (EHV-1) and equine herpesvirus type 4 (EHV-4) can each infect the respiratory tract, causing disease that varies in severity from subclinical (not apparent) to severe. Infection of the respiratory tract with EHV-1 and EHV-4 typically first occurs in foals early in life, but recurrent infections are seen in weanlings, yearlings and young horses entering training — especially when horses from different sources are commingled.

Clinical signs of the respiratory form of EHV-1/EHV-4 include:

- Fever
- Lethargy
- Anorexia
- Nasal discharge
- Cough

EHV-1 also causes:

- Epidemic abortion in mares
- The birth of weak non-viable foals
- Sporadic paralytic neurologic disease (equine herpesvirus myeloencephalopathy — EHM) secondary to vasculitis of the spinal cord and brain

Both EHV-1 and EHV-4 spread via coughing horses, by direct and indirect contact with nasal secretions and, in the case of EHV-1 abortion, contact with aborted fetuses, fetal/placental fluids and the placenta. Horses can have latent infections and may not show clinical signs, but may experience reactivation of infection and shed the virus when stressed. Those factors compromise efforts to control these diseases and explain why outbreaks of EHV-1 or EHV-4 can occur in closed populations.

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**Risk-based vaccines take into account  
your horse's unique lifestyle.**

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## Potomac Horse Fever (PHF)

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Caused by *Neorickettsia risticii* (formerly *Ehrlichia risticii*) and originally described in 1979 as a sporadic disease affecting horses residing in the eastern United States near the Potomac River, PHF has since been identified in various other geographic locations in the United States and Canada. The disease is seasonal, occurring between late spring and early fall in temperate areas, with most cases in July, August and September at the onset of hot weather.

Clinical signs are variable but may include:

- Fever
- Mild to severe diarrhea
- Laminitis
- Mild colic
- Decreased abdominal sounds
- Uncommonly, pregnant mares can abort

**If PHF has been confirmed on a farm or in a particular geographic area, it is likely that additional cases will occur in future years.**

Foals appear to have a low risk of contracting the disease.





## Strangles (*Streptococcus equi*)

*Streptococcus equi* subspecies *equi* (*S. equi* var. *equi*) is the bacterium that causes the highly contagious disease strangles (also known as “distemper”). Strangles commonly affects young horses (weanlings and yearlings), but horses of any age can be infected. **Vaccination against *S. equi* is recommended on premises where strangles is a persistent endemic problem or for horses that are expected to be at high risk of exposure.**

The organism is transmitted by direct contact with infected horses or subclinical shedders, or indirectly by contact with people, water troughs, hoses, feed bunks, pastures, grooming equipment and even insects contaminated with nasal discharge from infected horses. *S. equi* has demonstrated environmental survivability, particularly in water sources and when protected from exposure to direct sunlight and disinfectants, and can be a source of infection for new additions to the herd.

Infection by *S. equi* induces a profound inflammatory response. Clinical signs may include:

- Fever (102° to 106° F)
- Difficulty swallowing or anorexia
- Harsh, high-pitched breathing sound
- Swollen lymph nodes (+/- abscessation)
- Abundant nasal discharge with mucous and pus

## Equine Viral Arteritis (EVA)

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Equine Viral Arteritis (EVA) is a contagious disease caused by equine arteritis virus, an RNA virus that is found in horse populations in many countries. While typically not life-threatening to otherwise healthy adult horses, **EVA can cause abortion in pregnant mares and, uncommonly, death in young foals; it can also establish a long-term carrier state in breeding stallions.** While various horse breeds appear equally susceptible to EVA, the prevalence of infection can vary widely, with higher seropositivity rates occurring in Standardbreds and Warmbloods.

Clinical signs, if they occur, typically develop 3-7 days post-infection and are variable but may include:

- Fever, depression
- Anorexia
- Dependent edema (lower limbs, scrotum and prepuce or mammary glands)
- Localized or generalized urticaria (severe itching or hives)
- Swelling above or around the eye
- Conjunctivitis
- Serous to mucoid nasal discharge

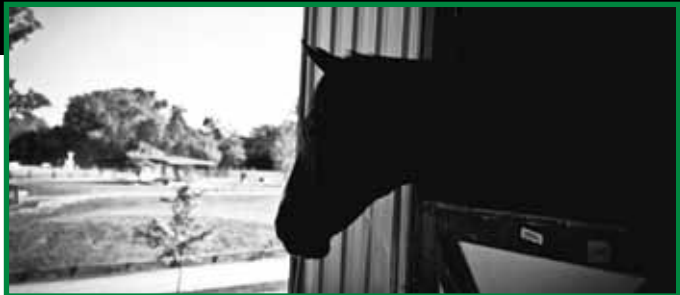
Abortion is a frequent sequel to infection in the unprotected pregnant mare. Young foals exposed to EVA can develop a life-threatening pneumonia or pneumoenteritis.

## Rotavirus

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Rotavirus is a major infectious cause of foal diarrhea and has been documented to cause 50 percent or more of foal diarrhea cases in some areas. While rotavirus diarrhea morbidity can be high (50 percent of susceptible foals), mortality is low (<1 percent) with veterinary intervention.

**Equine rotavirus is transmitted via the fecal-oral route and damages the small intestinal villi, resulting in cellular destruction, maldigestion, malabsorption and diarrhea.**



Vaccination of mares results in a significant increase in foals' rotavirus antibody titers. Field trials of rotavirus vaccination in pregnant mares have shown a decrease in incidence and severity of foal diarrhea on farms that historically had annual rotaviral diarrhea cases. According to AAEP, other studies have shown increased rotavirus antibody in vaccinated mares' colostrum.

## **Anthrax**

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**Anthrax is a serious and rapidly fatal septicemic disease** caused by proliferation and spread of the vegetative form of *Bacillus anthracis* in the body. Infection is acquired through ingestion, inhalation or contamination of wounds by soil-borne spores of the organism. Anthrax is encountered only in limited geographic areas where alkaline soil conditions favor its survival. Vaccination is indicated only for horses pastured in endemic areas.

## **Botulism**

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Botulism is caused by the exotoxin of *Clostridium botulinum* and typically occurs when horses eat decayed vegetable matter, animal carcasses or improperly prepared haylage or silage.

**Horses are extremely susceptible to the toxin, which is the most potent biological toxin known.** It causes neuromuscular weakness that progresses to paralysis.

Clinical signs include:

- Weakness
- Frequent lying down
- Muscle tremors
- Drooping tail
- Protruding tongue
- Constipation
- Stumbling and collapse
- Paralysis

Death is due to respiratory paralysis. Treatment with antibiotics or antitoxin is helpful if given early in the course of the disease.

## Special care for broodmares

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Broodmares should be placed on specific vaccination programs. An important safeguard during your mare's pregnancy is immunization against Equine Herpesvirus Type 1 (EHV-1) at the beginning of the 5th, 7th and 9th months of gestation.

**The EHV-1 strain of equine herpesvirus is the leading cause of infectious viral abortions in mares.** EHV-1 is typically associated with late-term abortions and the delivery of a well-preserved fetus and outwardly normal placenta. Most horses become infected with EHV-1 during the first year of life. In the majority of cases, the virus becomes latent, just waiting for stress-induced reactivation. Sources of infection for pregnant broodmares include clinically ill horses shedding the virus in nasal secretions, asymptomatic horses experiencing reactivation of latent infection and viral shedding or virus-laden uterine secretions and placenta/fetus from mares aborting due to EHV-1.

To reduce the risk of EHV-1 abortion, vaccinate your mare with Prodigy® at the start of months 5, 7 and 9 of gestation. All horses in close contact with broodmares — such as barren mares, stallions and teaser stallions — should also be maintained on a rigorous EHV-1 vaccination program. It's also important to reduce your pregnant mare's exposure to groups of young horses and any new arrivals that may be shedding EHV-1. Consult your veterinarian for more information.

You should booster your pregnant mare 4 to 8 weeks prior to foaling. This important series of pre-foaling booster vaccinations stimulates the mare to produce high levels of protective antibodies at a time during late pregnancy when she is also producing antibody-rich colostrum. The newborn foal relies on ingestion of colostrum and absorption of these antibodies during the first 12 to 24 hours of life for protection against a wide variety of viral and bacterial diseases during the early postnatal period.

**To learn more about vaccinations for broodmares, visit [FoilCare.com](http://FoilCare.com) or go to [AAEP.org](http://AAEP.org) and click on vaccination guidelines.**



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**Booster your mare 4 to 8 weeks prior to foaling:**

- Eastern/Western Encephalomyelitis (EEE/WEE)
- Tetanus
- West Nile Virus (WNV)
- Rabies (if not administered pre-breeding)
- Equine Influenza Virus (EIV)
- Equine Herpesvirus (EHV-1 and EHV-4)

**Vaccination against strangles, potomac horse fever, botulism and rotavirus is recommended only if there is a high risk of disease in your region or on your farm. Consult with your veterinarian to determine if these vaccines are indicated for your mare.**

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## Just for foals

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At birth, foals inherit immediate disease protection through their vaccinated dam's colostrum. Eventually these maternal antibodies decline and the foal will need added protection, which comes in the form of vaccines.

Work with your veterinarian to develop a customized vaccination schedule that takes into account your region of the country, endemic diseases on your farm and your foal's risk of disease exposure.

Timing of the first vaccinations is critical. The maternally derived colostrum antibodies that provide the foal with temporary protection are the same antibodies that prevent the foal from mounting an acceptable immune response to vaccines administered too early.

**To learn more about vaccinations for foals, visit [FoilCare.com](http://FoilCare.com) or go to [AAEP.org](http://AAEP.org) and click on vaccination guidelines.**

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**The recommendations below are for foals born to mares who received pre-foaling vaccinations against the referenced diseases.**

### **Equine Herpesvirus (EHV-1 and EHV-4)**

#### **Eastern/Western Encephalomyelitis (EEE/WEE)**

#### **West Nile Virus (WNV)**

#### **Tetanus**

Administer a three-dose series: The first dose between 5-6 months of age, the second dose 4-6 weeks later and the third dose 3-4 months later.

#### **Rabies**

Administer a two-dose series if the mare had been previously vaccinated (even if prior to breeding): The first dose between 5-6 months and the second dose 3-4 weeks later. If the mare had never been vaccinated for rabies, the foal needs only the first dose.

#### **Equine Influenza (EIV)**

With a killed vaccine, administer a three-dose series: The first dose beginning at 6 months of age, 4-6 weeks later for the second dose and between 10-12 months of age for the third dose. If using an intranasal vaccine, administer one dose at 11 months. Revaccination every 6 months is recommended.

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## For horses that travel

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If your horse participates in horse shows or competitive events, you must take these travel plans into consideration when you decide on an immunization program. Certain vaccines will be important if your horse is exposed to many other horses from various locations. These vaccinations should be given at least 2 weeks prior to the event so that your horse will have time to develop immunity. If you are using an intranasal equine influenza vaccine, such as Flu **Avert** I.N., it can be administered just 5-7 days before the event. Equine herpesvirus (rhinopneumonitis) and equine influenza vaccinations are essential to protect any horse that travels regularly and/or is exposed to other horses.

It's advisable to exercise extreme caution when hauling mares during the last trimester of pregnancy. The stress of hauling may lead to reactivation of a latent equine herpesvirus infection and subsequent abortion.



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We support unwanted horses through our  
**Unwanted Horse Veterinary Relief Campaign.**  
Every vaccine purchase helps horses in rescue  
receive core vaccines at no cost.  
Learn more at [uhvrc.org](http://uhvrc.org).



The **Unwanted Horse**  
Veterinary Relief Campaign

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## Unwanted Horse Veterinary Relief Campaign

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Founded in 2009, the Unwanted Horse Veterinary Relief Campaign provides complimentary vaccines to qualifying equine rescue and retirement facilities. Our goal is to help the horses stay healthy and make them more adoptable through up-to-date vaccinations.

For every Merck Animal Health product purchased, we will donate a set portion to this cause. Since the program's inception, we have provided more than 15,000 doses of vaccine to horses in rescue.

In addition to purchasing products, AAEP-member veterinarians who want to help can work with their local equine rescue to apply for the free vaccines. Applications and details are at [uhvrc.org](http://uhvrc.org).

## We're for the horse™

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At Merck Animal Health, we are driven by one mission – the health and welfare of the horse. Our products, our research and our horse owner programs are all focused on providing a better life for our equine companions and better medicine for the veterinarian. Our vaccines are safe, convenient and, of course, effective.



## Vaccines are not all the same

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At Merck Animal Health, we have two unique reasons our vaccines have low reaction rates and high degrees of effectiveness – our Antigen Purification System™ and our Havlogen® adjuvant.

### Antigen Purification System

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A vaccine must be safe. We developed the Antigen Purification System (APS) for removing unwanted protein and cellular debris from the vaccine antigen.

By purifying the vaccines in this method, we reduce the debris that can cause undesirable injection site reactions in the horse. This is why our popular Prestige® five-way vaccine has an exceptional safety profile and an extremely low reaction rate.

### Exclusive Havlogen Adjuvant

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Our killed vaccines are highly effective because of their exclusive Havlogen adjuvant.

Havlogen produces a booster effect, stimulating higher, longer-lasting protection through the slow release of antigens. Because of Havlogen, the vaccine stays in suspension and doesn't settle to the bottom of the vial — for consistency and potency in every dose.

The filtration technology used in manufacturing Havlogen is so advanced, vaccines that include it have been shown to be 98 percent reaction-free in field safety trials.

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**“If we always do what’s right for the horse, we will never go wrong.”**

D. Craig Barnett, D.V.M.  
Senior Equine Technical Services Veterinarian  
Merck Animal Health

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## Merck Animal Health Vaccines at a Glance

	EEE/WEE	VEE	Tetanus Toxoid	West Nile Virus	Influenza (EIV)	EHV-1 EHV-4	Abortion EHV-1	Rabies
Prestige V + WNV	X		X	X	X	X		
Prestige V + VEE	X	X	X		X	X		
Prestige V	X		X		X	X		
Prestige IV FoalShot	X		X			X		
Prestige II					X	X		
Prestige						X		
Prodigy®							X	
Flu <b>Avert</b> ® I.N.					X			
Encevac®-T + WNV	X		X	X				
Encevac + WNV	X			X				
Encevac-T	X		X					
Encevac TC-4	X		X		X			
Encevac TC-4 + VEE	X	X	X		X			
Encevac-T + VEE	X	X	X					
EquiRab®								X
Super-Tet®			X					
Equi-Nile™				X				



***We're for the horse.™***

***And for helping the unwanted horse. Visit [uhvrc.org](http://uhvrc.org)***



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