



# Equine Vaccination Programs

Carolynn MacAllister, DVM  
OSU Extension Veterinarian

Lyndi Gilliam, DVM  
Assistant Professor, Equine Medicine

Vaccinations for horses save money—and lives. For relatively little investment, vaccinations for horses reduce the risk of diseases that cost considerably more to treat. While your local veterinarian should be consulted for the best vaccination program for your particular situation, the list below describes important equine diseases that should be considered in a vaccination program. It is important to remember that while vaccines are a vital part of any disease prevention program, they are not 100% effective. Vaccinating a horse for a given disease reduces their risk of being affected by that disease but does not guarantee 100% protection.

## Tetanus

**Cause**—Tetanus is caused by a bacterium, *Clostridium tetani*, found in the soil. The bacteria usually enter the body through a wound, such as a wire cut or a puncture. The bacteria produce a toxin that affects the horse's nervous system. Horses are very susceptible to tetanus, and the disease is fatal to more than 80 percent of affected horses.

**Clinical** signs of this disease include lameness, stiffness, a saw horse stance, inability to eat ("lockjaw"), protrusion of the third eyelid, and distortion of the muscles of the face (sardonic grin), and extreme increased sensitivity to noise.

**Preventive Treatment**—Two products are available: (1) tetanus antitoxin—gives immediate but short-lived protection and is given to known unvaccinated horses that have a wound. (2) tetanus toxoid—gives long acting protection but adequate protection takes two weeks to develop after the initial vaccination series is given. Tetanus toxoid is initially administered as two doses, one month apart, followed by a yearly booster. Foals can be given the vaccine at three to five months of age then a booster one month later followed by a yearly vaccination. Pregnant mares should be given tetanus toxoid one month before foaling. Vaccinated horses should be given a booster prior to any surgery or after an injury. *The preferable method of protecting horses from tetanus is the toxoid vaccination. Tetanus antitoxin, in rare instances, can cause fatal serum sickness and should only be used in unvaccinated horses.* Because of this risk, it is no longer recommended to give every newborn foal a dose of *tetanus antitoxin*. The best protection for the foal is a well vaccinated dam.

Oklahoma Cooperative Extension Fact Sheets  
are also available on our website at:  
<http://osufacts.okstate.edu>

## Equine Herpesvirus

**Cause**—There are five types of equine herpesvirus (EHV). Types one and four are the most common. Equine herpesvirus infections can cause respiratory disease, neurologic disease, and abortion.

Clinical signs of the respiratory form of EHV1 and 4 is typically seen in young horses (<2 years of age) and is usually noticed as mild coughing, clear drainage from the nose and/or eyes, and possibly a fever and decreased appetite. It is highly contagious from horse to horse and will often affect all horses in a barn in a matter of days.

The neurologic form of EHV 1 is usually noticed as wobbling in the rear end, urinary incontinence (urine dribbling) and a flaccid tail. In geldings or stallions, failure to retract the penis may also occur. Neurologic damage can be severe, subsequently, horses may fall or lie down and be unable to stand and horses can progress rapidly becoming down and unable to rise.

Abortions caused by EHV-1 and occasionally EHV-4 occur late in pregnancy (last 30-90 days). These forms of the virus can also result in foals born full term that are very weak and only live a short time after birth. This virus is extremely contagious and can result in multiple abortions on a farm if mares are in the same paddock or if they come into contact with infected mares, their aborted fetus or placenta.

**Preventive Treatment**—EHV vaccines are recommended to decrease the risk of viral abortion in pregnant mares and the respiratory disease in young horses. Current recommendations for pregnant mares are to vaccinate during the third, fifth, seventh, and ninth months of gestation. To protect foals against the respiratory form of this disease, it is recommended to administer a three dose primary series starting at 4 to 6 months of age vaccinating at monthly intervals assuming foal was born to a vaccinated mare. This initial vaccination series is followed by boosters every 2 to 3 months. Since immunity to this virus is short-lived, some veterinarians will vaccinate foals, young horses, and performance horses (basically any horse at high risk for exposure to infected horses) at 2 to 3 month intervals. It is important to get your veterinarian involved in herpes virus vaccination of pregnant mares because not every herpes virus vaccine is safe in the pregnant mare. It is also important to note that our knowledge is currently limited regarding vaccination induced protection against the neurological form of EHV, therefore you

should discuss current recommendations directly with your veterinarian.

## Influenza

**Cause**—Influenza virus is one of the most common causes of respiratory disease in horses.

**Clinical signs** of the influenza virus are extremely contagious with the typical clinical signs being fever, clear nasal discharge, coughing, and loss of appetite. Damage caused by the virus may predispose the horse to secondary bacterial infections of the respiratory tract or to recurrent airway obstruction (“heaves”).

**Preventive Treatment**—Vaccination can be helpful in preventing illness, and/or reducing the severity of infection, but the protection is short-lived with most injectable vaccines (3 to 4 months). Even vaccinated horses that do not get sick may pass the virus on to other healthy horses when exposed. The frequency of vaccination varies with risk of exposure to the virus, and with the type of vaccine product administered. Newer intranasal modified live vaccines for influenza can be administered to foals starting at 11 months of age, and every 6 months to one year thereafter, depending on risk of exposure. When using the intramuscular vaccine forms, horses with very little risk of exposure to the virus can be given an initial vaccination followed by a booster in 3 to 4 weeks, along with a yearly booster. Horses in contact with a large number of horses, for example at a boarding stable, training centers, racetracks, shows, and other such events, should be vaccinated every 2-3 months with intramuscular products, or every 6 months with intranasal products. Vaccination of foals with intramuscular products should begin at 6 months of age (assuming foal was born to a vaccinated mare), with a booster at 7 months, again at 8 months, and repeated every three months if the foal is at high risk of exposure. A three-dose primary series has been shown to induce a higher and more persistent immunity than the recommended two-dose series regardless of the age. The antibody response of foals born to mares vaccinated more than once a year may be inhibited for up to 24 weeks by the maternal protection provided by colostrum (first milk). Therefore, these foals should not receive their first influenza vaccination before 6 months of age. Pregnant mares can be vaccinated one month prior to foaling. It can take a horse’s respiratory tract three to four weeks to recover from damage done by influenza virus infection. Therefore, it is important to rest a horse after infection with influenza virus. A general rule of thumb is to rest the horse one week for every one day that it had a fever.

## Strangles

**Cause**—Strangles is a highly contagious upper respiratory disease caused by the bacteria *Streptococcus equi equi*. This bacteria is transmitted through direct contact or environmental contamination of discharges from infected horses. It can live for months in the upper respiratory tract of horses that do not appear ill, and these “healthy appearing” horses are an important source for new infections.

This disease occurs in horses of all ages but horses 1 to 5 years of age are more susceptible. Clinically affected horses may show the following signs: acute fever (103-106°F), thick, yellow to white nasal discharge, moist cough, loss of appetite, difficulty in swallowing, and abscesses of the lymph nodes

under or behind the jaw (which usually break open and drain pus 10 to 14 days after onset of clinical signs). Some horses may develop pneumonia or internal abscesses (“bastard strangles”). Horses may also develop severe muscle wasting secondary to strangles. Persistent depression, inappetence, weight loss or any signs of muscle loss indicate a much more severe form of the disease.

**Preventive treatment**—Since strangles is so highly contagious, horses should be isolated as soon as early clinical signs suggest the horse may be infected. To prevent this disease, strict quarantine is recommended for all new arrivals on a farm for at least 2 weeks. Strangles vaccinations are controversial. Horses that are exposed to the disease may not be immediately vaccinated as an adverse reaction of their immune system can occur. Horses that have a history of previously having strangles are also at risk of having this adverse reaction, therefore the benefit of the vaccine versus the risk of this reaction must be carefully weighed. We recommend consultation with your veterinarian prior to giving this vaccine. Similar to the influenza vaccine, there are both modified intranasal and killed intramuscular products. The intramuscular vaccine should be administered initially once, followed by 2 to 3 doses, at intervals 2 to 4 weeks apart (depending on the product used), followed by additional boosters every six months. There have been reports of vaccine failure and abscesses occurring at the injection sites with intramuscular killed products as well as signs of local upper respiratory infection with the intranasal product. As a result, this vaccine is best given under the supervision and advice of a veterinarian familiar with the horses or farm having problems with strangles. Research on the efficacy of strangles vaccines suggests clinical infection rate is decreased by 50% in vaccinated versus unvaccinated horses. For the vaccinated horses that develop a clinical infection, the vaccine helps to reduce the severity and duration of strangles.

## Equine Viral Arteritis

**Cause**—Equine Viral Arteritis (EVA) is a viral disease of horses that can cause severe outbreaks of respiratory disease and abortion. Transmission of EVA occurs through inhalation of the virus, exposure to virus contaminated objects, or environment. Venereal transmission also occurs; a high percentage of infected stallions become chronic carriers shedding virus for a variable length of time. Even though the virus has a worldwide distribution, outbreaks are uncommon. However, the EVA vaccine has been used to control outbreaks.

**Clinical signs** can be quite variable among horses and between separate outbreaks. Clinical signs may include any combination of the following: fever, depression, loss of appetite, excessive tearing, diarrhea, clear nasal discharge, and coughing. Other signs that have been reported include edema or swelling of the legs, body, head, and scrotum (stallion) along with abortion (pregnant mares).

**Preventive Treatment**—Vaccines may provide complete to partial protection against clinical signs of EVA. The vaccine is given on an annual basis; stallions and mares should be vaccinated three weeks before breeding. Pregnant mares should not be vaccinated unless under the supervision of a veterinarian. The vaccine has also been given to control outbreaks of the respiratory form of EVA in concentrated populations of performance horses. A few countries will not allow horses that carry a vaccine titer to EVA to enter their

country. Check with your local veterinarian if you have questions concerning the need for vaccinations on a farm or about export regulations.

## Rabies

**Cause**—The occurrence of rabies in horses is very low but the disease is fatal. Since rabies is also life threatening in humans, vaccination of horses against rabies is highly recommended.

**Preventive Treatment**—Only use a rabies vaccine approved for use in horses with an annual revaccination. Foals should be vaccinated starting at 3 to 4 months followed by a second dose at one year of age with an annual booster.

## Potomac Horse Fever (Equine Monocytic Ehrlichiosis)

**Cause**—Potomac Horse Fever (PHF) is caused by the ehrlichial parasite, *Neorickettsia risticii*. The disease is most common in the eastern United States but has now been identified in many regions of the United States, Canada, and elsewhere. A few cases have been reported in Oklahoma near the Illinois River. The occurrence of PHF is seasonal, occurring primarily between late spring and fall in the more temperate areas of the country, with the majority of the cases occurring during the summer months.

**Clinical signs** of PHF may include fever, loss of appetite, gastrointestinal signs varying from mild colic to profuse diarrhea, and laminitis.

**Preventive Treatment**—Horses traveling or living in endemic areas (areas where confirmed cases of PHF have occurred) should be protected by vaccination. The vaccine is given in a two dose primary series administered 3 to 4 weeks apart. A revaccination in 4 to 6 months is recommended in highly endemic areas because protection is short-lived. A three dose primary series may be needed for foals starting at 3 to 4 months of age. Pregnant mares should be vaccinated twice a year with one dose timed 4 to 6 weeks before foaling. It has recently been shown that mayfly insects are involved in the transmission of this disease, and limiting the use of artificial lighting at night around your horses can reduce the risk of exposure to mayflies, and thus PHF.

## Encephalomyelitis (Eastern/Western)

**Cause**—In the U.S., encephalomyelitis in horses is caused by either the eastern (EEE) or western (WEE) equine encephalomyelitis virus. The eastern or western virus is prob-

ably transmitted from asymptomatic wild birds and rodents to horses by biting insects like mosquitoes.

Infected horses may exhibit fever, drowsiness, seizures, unstable gait, inability to rise, or blindness.

**Preventive Treatment**—The disease is generally fatal, especially in the case of eastern encephalomyelitis. Prevention of viral encephalitis includes insect control and vaccination. The initial vaccination protocol for horses involves two doses of vaccine 3 to 4 weeks apart. Vaccinations should be scheduled according to the mosquito season in your area. In areas with a long mosquito season biannual vaccinations may be necessary, whereas in areas with shorter mosquito seasons boosters may be given annually 3 weeks prior to the start of mosquito season. Pregnant mares should be given a booster at 4 to 6 weeks before foaling.

## West Nile Encephalitis

**Cause**—West Nile Encephalitis is caused by a mosquito-borne virus. Mosquitoes become infected with the West Nile Virus (WNV) by feeding on infected wild birds. Occasionally infected mosquitoes can transmit the virus to people and horses.

WNV infects the central nervous system of animals and people. The clinical course of this disease typically progresses from nonspecific signs such as fever, loss of appetite, and lethargy to severe neurologic signs. These signs may include behavior changes, ataxia (wobbliness), head pressing, excitability, teeth grinding, muscle tremors of face or neck, blindness, inability to swallow, seizures, and coma. Infection with this virus does not always cause illness.

**Prevention**—Mosquito control and vaccination of horses may significantly reduce the incidence of this disease (Refer to OSU Extension Fact Sheet ANSI-3925 for more information on WNV prevention and mosquito control).

Vaccines are labeled to provide protection for one year after the appropriately timed vaccination series (initial dose and second booster in 4 to 6 weeks). Even though the USDA approved label is for once yearly boosting of vaccines after the initial series, many experts recommend an additional booster be given around July/August prior to the peak of mosquito season or twice yearly boosters timed appropriately. A typical vaccination schedule for a foal may vary with the particular West Nile vaccination product utilized and if the foal is born from a non-vaccinated or vaccinated mare. The vaccines are restricted to veterinary use only. Contact your local veterinarian about the appropriate timing for WNV vaccinations in the area of Oklahoma that your horses live.

## **The Oklahoma Cooperative Extension Service**

### ***Bringing the University to You!***

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0208