W 659

EQUINE DISEASES AND VACCINES

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An effective disease prevention program is essential for equine health and well-being. Understanding disease risk, transmission, and how to implement preventative measures is extremely important to maintain the health and usefulness of the horse throughout its lifetime.

Contagious vs. Infectious

Contagious diseases are transmitted by contact with an infected animal or object.

Infectious diseases are caused by microorganisms, bacteria, fungus, virus or other agents that enter the body of an organism.

Primary Diseases Affecting Horses

Equine Infectious Anemia (EIA) is a fatal bloodborne retroviral disease that can affect horses of all ages and breeds. EIA is an infectious disease, and transmission is most likely to occur via biting flies. It is also possible for EIA to spread through the use of unclean needles or other equipment contaminated with blood. Signs of EIA include fever, depression, pale gums, weight loss, swelling of the underbelly area, weakness and death. There is no vaccine or cure available for EIA, and once infected, the horse is a carrier for life and will require lifelong isolation or euthanasia.

Rabies is a fatal viral disease severely affecting the neurological system. Rabies is an infectious disease spread by contact with saliva from infected animals. In the United States, skunks and raccoons are the predominant reservoirs for rabies. Signs of rabies include depression, aggression, lameness or paralysis, colic and a saw horse stance. Rabies does pose a risk of zoonosis or transmission from animals to humans. Prevention is necessary because there is a 100 percent chance of mortality if an animal contracts this disease. If any neurological symptoms are present, treat the animal as if it has rabies until a veterinarian can examine the animal. Avoid placing hands in the horse's mouth and seek help from a veterinary medical professional immediately.

Tetanus is a soilborne anaerobic bacterium caused by *Clostridium tetani.* It is an infectious disease, spread by puncture wounds or other lacerations. Signs of tetanus include stiffness in the face and neck, locked jaw, rigid ears, appearance of the third eyelid, and a low-grade fever. If left untreated there is an 80 percent chance of mortality.

West Nile Virus (WNV) is a vectorborne viral disease causing fatal neurological damage. It is a noncontagious disease transmitted only via insects. Birds are reservoirs of the virus. The virus is then transmitted from the reservoirs to horses by mosquitoes and other biting insects. Signs of WNV

include stumbling, depression, weakness, low-grade fever, paralysis and even death. If left untreated there is a 33 percent chance of mortality. While a human cannot not contract WNV directly from a horse, carrier insects can also bite and infect humans.

Eastern and Western Equine Encephalitis (EEE/WEE) is a vectorborne viral disease affecting the central nervous system of the brain. It is a noncontagious disease transmitted only via insects. Birds and rodents are reservoirs of the virus. The virus is then transmitted from the reservoirs to horses by mosquitoes and other biting insects. Signs of EEE/WEE include change in behavior, depression, head pressing, circling, weight loss and a wobbly gait. If left untreated there is a 50-90 percent chance of mortality.

Potomac Horse Fever is a bacterial disease, *Neorickettsia risticcii,* that is highly predominant in the eastern U.S. and other areas containing ponds, rivers or other bodies of fresh water. It is a noncontagious, infectious disease associated with snails, flatworms and water-loving insects. Signs of Potomac horse fever include depression, fever, diarrhea, dehydration and laminitis.

Equine Herpesvirus (EHV) is a herpes viral disease causing respiratory signs and abortion. It is a contagious disease spread by nasal discharge or contaminated items such as tack or stalls. Signs of EHV include fever, nasal discharge, lethargy, reddened eyes, cough and late-term abortion.

Strangles is a highly infectious bacterial disease, *Streptococcus equi,* affecting mostly young horses. It is extremely contagious and is spread by direct contact between horses or contact with contaminated surfaces. Signs of strangles include fever, off feed, swollen and/or abscessed lymph nodes, and nasal discharge.

Botulism is produced by a bacterium, causing paralysis and 100 percent mortality in untreated cases.

Equine Influenza is a highly contagious viral disease causing nasal discharge, cough and fever.

Equine Viral Arteritis is a contagious viral disease transmitted by secretions from infected animals. Signs include fever, respiratory problems, severe cough and fluid accumulation in the body.

Core Vaccinations

Following a vaccine protocol for all vaccines recommended by a local veterinarian limits the transmission of diseases that impact the equine industry negatively. Core vaccines are recommended for most horses because they protect against common diseases in an area or region, pose a health risk to the general population, are highly infectious, or can cause severe disease. In some instances, core vaccines may be required by law. Core vaccines are highly effective, safe, and provide high benefits with low risk to the animal.

It is highly recommended that all horses, regardless of age, status or use, receive the following core vaccines: rabies, tetanus toxoid, Eastern/Western equine encephalitis, and West Nile virus as well as a Coggins test yearly. In some instances, core vaccines may be boostered during times of disease outbreak. Based on location, exposure, use and any underlying conditions, additional risk-based vaccines may be recommended by your local veterinarian.

Risk-Based Vaccinations

Risk-based vaccines include anthrax, botulism, equine herpesvirus (rhinopneumonitis), equine influenza, equine viral arteritis, leptosporosis, Potomac horse fever, rotaviral diarrhea and strangles. Location, exposure risk and use are key factors in determining if a horse may benefit from receiving risk-based vaccines.

For example, close proximity to a freshwater stream or standing water in eastern areas of the United States and Canada increases risk of Potomac horse fever. Thus, horses residing in these regions may be at increased risk for contracting Potomac horse fever, and the vaccination may be recommended due to exposure risk.

A horse's use can aid in determining risk-based vaccine requirements as well. Show, trail, breeding or backyard status will either increase or decrease the amount of exposure to other horses as well as other locations. Show horses are transported frequently and comingle with many different horses, all with unknown exposure levels. Trail horses also have increased comingling, as well as exposure to different environments. Trails may bring horses in contact with bodies of water and therefore water-loving insects.

Exposure to other horses increases chances of the transmission of diseases such as strangles and equine herpesvirus, and thus outbreaks are often seen in areas where horses gather, such as show grounds, racetracks and overnighting facilities. Mules and donkeys can be silent shedders, so comingling with these equine species can increase the risk of transmission.

Breeding mares (as seen in Tables 1 and 2 below) will have different vaccine requirements in some cases due to passive transfer of immunity to their offspring. Backyard horses have limited movement and exposure to others, but location can still be important for assessment of risk-based vaccinations. Consult with your veterinarian to determine if your horse should receive any risk-based vaccines in combination with the core vaccinations during preventative care management.

Vaccination Schedules

The following vaccination schedules are recommended protocols for core and risk-based vaccines as determined by the American Association of Equine Practitioners. Tables 1 and 2 provide information for adult horses that have been previously vaccinated as well as those without a known vaccination history. Separate recommendations for broodmares have also been provided. Tables 3 and 4 provide information for foals from vaccinated dams as well as those from unvaccinated dams.

Administration Routes

Vaccines are often administered through three primary routes. Each vaccine may be available in multiple administration means, while others may be only effective if administered through one specific route. Vaccines should ***never*** be given intravenously due to risk of anaphylactic shock.

Intramuscular Injections (IM) are given deep into the muscle, usually in the base of the neck.

Subcutaneous Injections (SQ) are given underneath the skin.

Intranasal Vaccines are given in the nostrils.

Table 1: Adult Horse and Broodmare Core Vaccination Schedule

Adapted from AAEP Core Vaccination Guidelines

CORE VACCINES	**Adult Horse** Previously vaccinated	**Adult Horse** Unvaccinated or unknown history	**Broodmare** Previously vaccinated	**Broodmare** Unvaccinated or unknown history	**Additional Information**
Rabies	Annually	Single dose, Annual revaccination	Single dose, 4-6 weeks before foaling	Single dose, 4-6 weeks before foaling	May be given after foaling and prior to rebreeding since it has a long duration of immunity
Tetanus	Annually	2-dose series (4-6 week interval), Annual revaccination	Annually, 4-6 weeks before foaling	2-dose series (4-6 week interval), revaccinate 4-6 weeks before foaling	If 6 mo. since last vaccine and injury or surgery occurs, vaccinate immediately
West Nile Virus	Annually in spring prior to vector season	2-dose series (4-6 week interval), Revaccinate prior to onset of vector season	Annually, 4-6 weeks before foaling	Preferably vaccinate when open *High Risk: See adult horse unvaccinated*	Consider semiannual revaccination for horses in high-risk areas, or horses less than 5 years old or greater than 15, or immuno-compromised horses
Eastern/Western Equine Encephalitis	Annually in spring prior to vector season	2-dose series (4-6 week interval), Revaccinate prior to onset of vector season	Annually, 4-6 weeks before foaling	2-dose series (4-week interval), revaccinate 4-6 weeks before foaling	Consider semiannual revaccination for horses in high-risk areas or immuno-compromised horses
Coggins Test (EIA)	Annually	Annually	Annually	Annually	

Table 2: Adult Horse and Broodmare Risk-Based Vaccination Schedule

Adapted from AAEP Risk-Based Vaccination Guidelines

RISK-BASED VACCINES	**Adult Horse** Previously vaccinated	**Adult Horse** Unvaccinated or unknown history	**Broodmare** Previously vaccinated	**Broodmare** Unvaccinated or unknown history	**Additional Information**
Potomac Horse Fever	Semiannually to annually	2-dose series (3-4 week interval), Semiannual or Annual revaccination	Semiannual, 4-6 weeks before foaling	2-dose series 1st: 7-9 weeks before foaling 2nd: 4-6 weeks before foaling	Revaccination interval of 3-4 months if in high-risk area
Equine Herpesvirus	Annually	3-dose series (4-6 week intervals)	3-dose series Give at 5, 7 and 9 months of gestation (product labeled for protection against EHV abortion)	3-dose series Give at 5, 7 and 9 months of gestation (product labeled for protection against EHV abortion)	Consider semiannual revaccination for horses less than 5 years old, horses on breeding farms or in contact with pregnant mares, performance or show horses at high risk.
Strangles	Semiannually to annually	2-3 dose series (2-4 week intervals)	Semiannual, 4-6 weeks before foaling (Killed vaccine containing M-Protein)	3-dose series (2-4 week interval), 3rd: 4-6 weeks before foaling (Killed vaccine containing M-Protein)	Vaccination not recommended as a strategy in outbreak mitigation.

Table 3: Foal Core Vaccination Schedule

Adapted from AAEP Core Vaccination Guidelines

CORE VACCINES	**Foal** From vaccinated mare	**Foal** From unvaccinated or unknown history mare	**Additional Information**
Rabies	2-dose series 1st: at 6 mo. old 2nd: 4-6 weeks later	1 dose at 6 months of age, Annual revaccination	—
Tetanus	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old	3-dose series 1st: 3-4 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old	—
West Nile Virus	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old (prior to onset of next vector season)	3-dose series 1st: 3-4 mo. old 2nd: 4 weeks later 3rd: 8 weeks later	Schedule given is based on inactivated whole virus vaccine. Foals in the southeastern U.S. should have an additional primary dose at 3 mo. old because of early seasonal vectors
Eastern/Western Equine Encephalitis	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old (prior to onset of next vector season)	3-dose series 1st: 3-4 mo. old 2nd: 4 weeks later 3rd: 8 weeks later	Foals in the southeastern U.S. should have an additional primary dose at 2-3 mo. old because of early seasonal vectors
Coggins Test (EIA)	If mare has a negative test, then a foal less than 6 mo. old is not required to be tested.	Test for the first time at weaning and again after at least 60 days.	If the mare has a positive test then the foal can test positive for more than 6 mo.

Table 4: Foal Risk-Based Vaccination Schedule

Adapted from AAEP Risk-Based Vaccination Guidelines

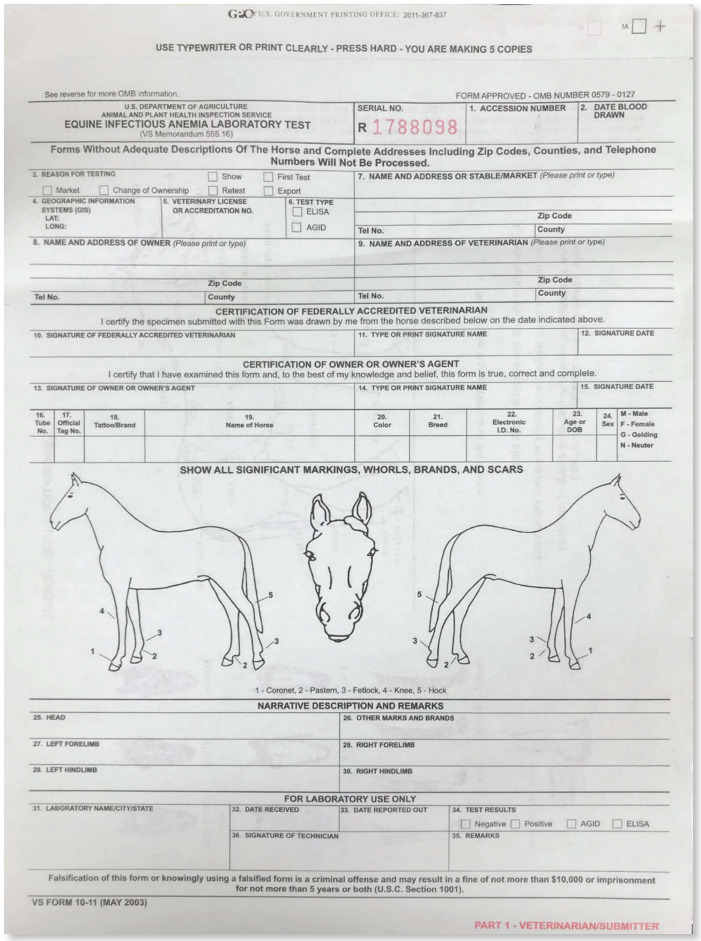
RISK-BASED VACCINES	Foal From vaccinated mare	Foal From unvaccinated or unknown history mare	Additional Information
Potomac Horse Fever	2-dose series 1st: 5 mo. old 2nd: 3-4 weeks later	2-dose series 1st: 5 mo. old 2nd: 3-4 weeks later	If in high-risk area, it may be given to younger foals at 4-week intervals until 6 mo. old
Equine Herpesvirus	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old (Revaccinate at 6 mo. intervals)	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 10-12 mo. old (Revaccinate at 6 mo. intervals)	Schedule given is for either inactivated or modified live vaccine
Strangles	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 4-6 weeks later	3-dose series 1st: 4-6 mo. old 2nd: 4-6 weeks later 3rd: 4-6 weeks later	Schedule given is based on killed vaccine

Additional Preventative Measures

Coggins tests are completed yearly to ensure negative results as there is no vaccine available for this disease. Yearly testing allows the state to keep track of the prevalence of the disease and limit its transmission.

Pest control is critical in preventing the spread of diseases. Control of breeding grounds is the first step in prevention. Manure piles should not be kept near housing because of increased parasite exposure. Stagnant water sources should also be avoided. Housing away from ponds, creeks and other water sources can limit biting insects. Proper pesticide application can also aid in prevention. Fly sprays and topical substances such as SWAT can not only provide comfort, but can also protect from vectors of diseases.

Biosecurity is another extremely important preventative. Quarantining new horses for two to four weeks when first entering a facility is ideal. Isolated horses should have minimal contact with others to avoid passing saliva and nasal discharges. All purchased horses should also have a negative Coggins test within the last six months. Avoid using the same equipment such as water and feed buckets, needles, brushes and tack. It is also a good idea to wear separate boots and clothing only at the home farm. Keeping extra boots for visitors to wear can also limit spread of potential diseases. Wear protective clothing when working with known carriers of diseases like EHV and strangles. Strict confinement of disease carriers is also necessary.



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ANIMAL AND PLANT HEALTH INSPECTION SERVICE
EQUINE INFECTIOUS ANEMIA LABORATORY TEST
(VS Memorandum 555.16)

SERIAL NO. R 1788098 | 1. ACCESSION NUMBER | 2. DATE BLOOD DRAWN

Forms Without Adequate Descriptions Of The Horse and Complete Addresses Including Zip Codes, Counties, and Telephone Numbers Will Not Be Processed.

3. REASON FOR TESTING ☐ Show ☐ First Test ☐ Market ☐ Change of Ownership ☐ Retest ☐ Export

4. GEOGRAPHIC INFORMATION SYSTEMS (GIS) LAT: LONG:

5. VETERINARY LICENSE OR ACCREDITATION NO.

6. TEST TYPE ☐ ELISA ☐ AGID

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8. NAME AND ADDRESS OF OWNER (Please print or type)
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9. NAME AND ADDRESS OF VETERINARIAN (Please print or type)
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CERTIFICATION OF FEDERALLY ACCREDITED VETERINARIAN
I certify the specimen submitted with this Form was drawn by me from the horse described below on the date indicated above.
10. SIGNATURE OF FEDERALLY ACCREDITED VETERINARIAN | 11. TYPE OR PRINT SIGNATURE NAME | 12. SIGNATURE DATE

CERTIFICATION OF OWNER OR OWNER'S AGENT
I certify that I have examined this form and, to the best of my knowledge and belief, this form is true, correct and complete.
13. SIGNATURE OF OWNER OR OWNER'S AGENT | 14. TYPE OR PRINT SIGNATURE NAME | 15. SIGNATURE DATE

16. Tube No.	17. Official Tag No.	18. Tattoo/Brand	19. Name of Horse	20. Color	21. Breed	22. Electronic I.D. No.	23. Age or DOB	24. Sex (M - Male, F - Female, G - Gelding, N - Neuter)

SHOW ALL SIGNIFICANT MARKINGS, WHORLS, BRANDS, AND SCARS

1 - Coronet, 2 - Pastern, 3 - Fetlock, 4 - Knee, 5 - Hock

NARRATIVE DESCRIPTION AND REMARKS
25. HEAD | 26. OTHER MARKS AND BRANDS
27. LEFT FORELIMB | 28. RIGHT FORELIMB
29. LEFT HINDLIMB | 30. RIGHT HINDLIMB

FOR LABORATORY USE ONLY
31. LABORATORY NAME/CITY/STATE | 32. DATE RECEIVED | 33. DATE REPORTED OUT | 34. TEST RESULTS ☐ Negative ☐ Positive ☐ AGID ☐ ELISA
36. SIGNATURE OF TECHNICIAN | 35. REMARKS

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PART 1 - VETERINARIAN/SUBMITTER

Example of a Tennessee Coggins Test

Equipment and vehicles should be cleaned before entering the barn. Maintaining clean facilities and disinfection of surfaces between uses will ensure limited transmission.

Understanding the primary diseases affecting Tennessee horses, disease signs and symptoms, and disease transmission allows for decreased exposure and unintentional spread. A vaccination protocol should include all core vaccines: rabies, tetanus toxoid, West Nile virus, Eastern and Western equine encephalitis, a yearly Coggins test, and other risk-based vaccinations recommended by a local veterinarian. Additional prevention measures include strict pest control and biosecurity. If you have any questions or concerns, contact your local county Extension agent, veterinarian or state Extension specialist.

References

"AAEP Infectious Disease Guidelines." America Association of Equine Practitioners, 2017, aaep.org/guidelines/infectious-disease-control/using-guidelines.

"Equine Association Updates Vaccination Guidelines." *Equine Association Updates Vaccination Guidelines*, JAVMA News, 1 Mar. 2008, www.avma.org/News/JAVMANews/Pages/080315l.aspx.

"Horse Disease Information." USDA APHIS | Horse Disease Information, 29 Jan. 2018, www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/horse-disease-information/ct_horses_index.

McCall , Cynthia A. "How to Give Your Horse an Intramuscular Injection." *EXtension,* Animal and Dairy Sciences, Auburn University, Dec. 1996, articles.extension.org/pages/29835/how-to-give-your-horse-an-intramuscular-injection.

Prado, Maria E. *Health Management Diseases of Domestic Animals.* Great River Learning, 2017.

Rules of the Tennessee Department of Agriculture Animal Health. Chapter 0080-02-01. Pg. 4. June, 2017.

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