



Vaccines – what should your horse receive and why?

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Vaccination

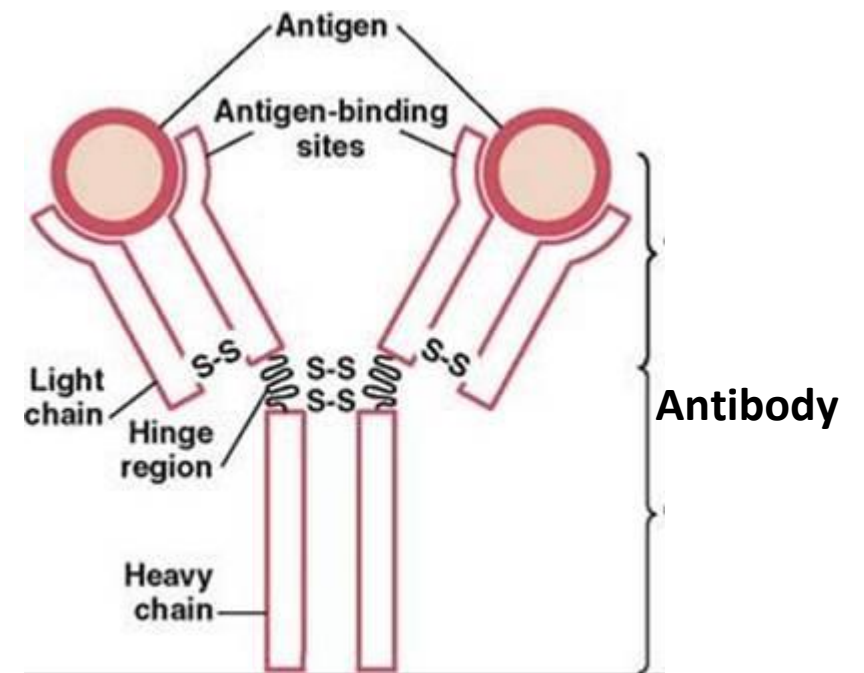
- What is a vaccine
 - Introduces an antigen into system that elicits specific immune response
 - Antigen – foreign substance (germs) like bacteria, virus, chemical, toxin
 - Types: Live, modified live, attenuated/killed/inactivated vaccines





Vaccination

- How the body responds to antigen
 - White blood cells (ready to attack)
 - First line of defense
 - Antibodies (memory)
 - Body has to have seen antigen before





Vaccination

- Vaccines stimulates “memory” immunity
- This memory can then:
 - reduce disease severity
 - reduce disease shedding
 - Helping other horses
 - *won't necessarily prevent disease in all circumstances*



Vaccination in the horse

Questions to ask before vaccination

- Risk of infection
- Consequences of disease
- Anticipated effectiveness of product
- Potential for severe adverse reaction
- Cost of immunization v. cost of disease



Vaccination in the horse

Risks of vaccination

Immune response

- Muscle soreness at injection site
- Mild fever for couple days
- Mild lethargy

Vaccine reaction

- Anaphylactic reaction
- Purpura hemorrhagica
- Colic
- Injection site abscess (IN)

APPROPRIATE RESPONSE



Vaccination in the horse

- Use a licensed product  Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE
- Booster appropriately – typically first vaccines
- Administer at least *14 days* prior to exposure
- Veterinarian should administer or directly supervise administration



Vaccination in the horse

- Checking antibody titers to determine need for vaccine
 - **CAN'T RECOMMEND AT THIS TIME**



Vaccination in the horse

Diseases typically vaccinated against in the horse

- Equine influenza virus (EIV)
- Equine herpes virus 1/4 (EHV)
- Streptococcus equi equi (Strangles)
- West Nile Virus (WNV)
- Eastern/Western encephalitis
- Tetanus
- Rabies



Equine Influenza Virus (EIV)



Equine influenza virus

Viral respiratory infection

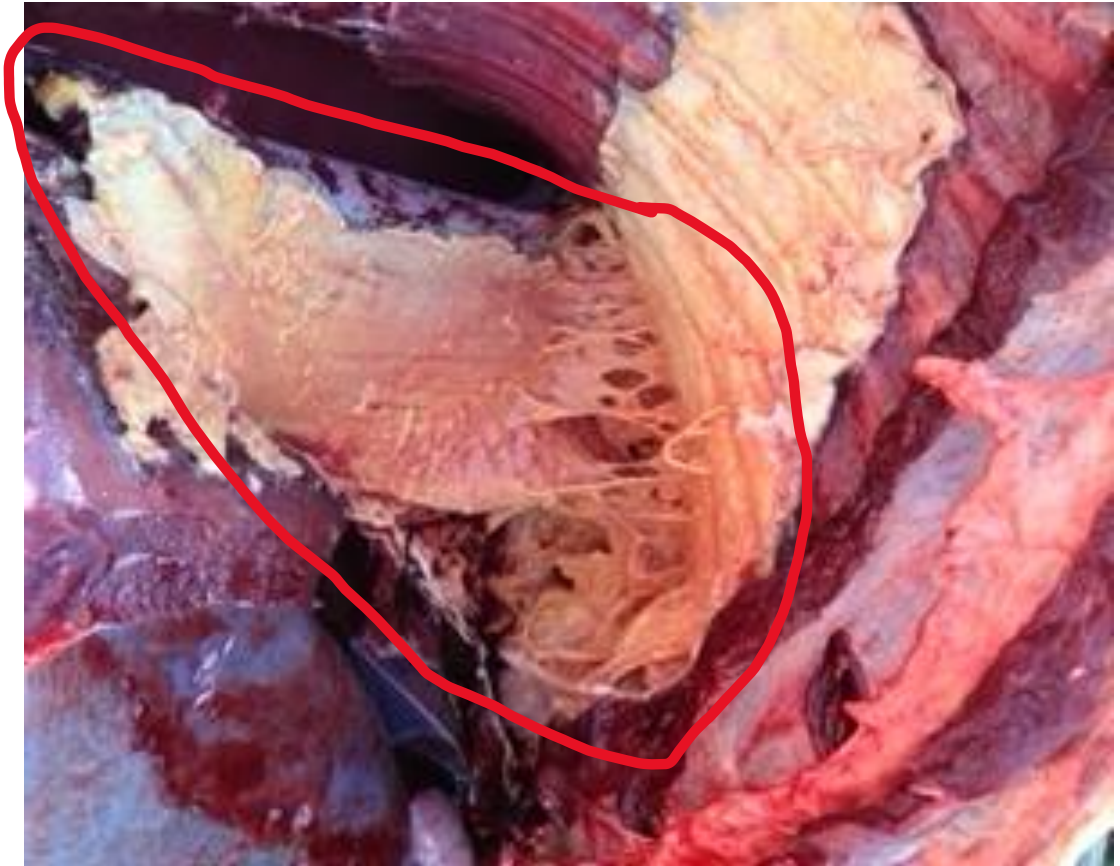
- **COUGH, nasal discharge, fever**
- **Very contagious**
- Spreads from horse to horse
 - Via respiratory secretions or fomites
 - Up to 50 yards
 - Can harbor infection in some other animals



Equine influenza virus

Complications

- PNEUMONIA
- Prolonged coughing – weeks to months





Equine influenza virus

• Reports of outbreaks

**EQUINE FLU, STREPTOCOCCUS CAUSED CANON CITY OUTBREAK;
INTERAGENCY TEAM BEGINS REVIEW**

**Epidemiological and virological investigations of equine
influenza outbreaks in Ireland (2010–2012)**

**Insights into the economic consequences of the 2007 equine
influenza outbreak in Australia**

**Outbreak of equine influenza among horses
in Hong Kong during 1992.**

**Disease progression, pathologic, and virologic findings
of an equine influenza outbreak in rescue donkeys**



Equine influenza virus

Vaccination vs. no vaccination**

UNVACCINATED HORSE	ANNUALLY VACCINATED HORSE	SEMI-ANNUALLY VACCINATED HORSE
SEVERE equine influenza		
7.4%	0.0%	0.0%
MODERATE equine influenza		
19.2%	6.8%	4.2%
MILD equine influenza		
66.6%	35.5%	22.3%
TOTAL RISK		
93.2%	42.3%	26.5%

- Vaccination reduces severity of clinical disease and shedding
- Vaccinate every 6 months for at risk horses





Equine influenza virus

- Vaccination
 - Intranasal modified live vaccine
 - Intramuscular killed vaccine
 - Alone or as combination vaccine





Equine Herpes Virus (EHV)



Equine Herpes Virus

EHV-1 and 4 aka Rhinopneumonitis

- **EHV-1** begins as respiratory disease and can develop into **neurologic** disease or **abortion**
 - Viremia = virus circulates around blood stream
- **EHV-4 only a respiratory infection** and does not lead to neurologic disease



Equine Herpes Virus

Spread via respiratory secretions

- Horse to horse (transmit up to 5 meters)
- Via fomites (equipment, tack, humans)

Most horses exposed at a young age

- *So why signs of acute disease?*

It's FOREVER



Equine Herpes Virus

Respiratory disease

- Mild respiratory signs +/- fever
 - More common in younger horses
- Sometimes go unnoticed

Neurologic disease

- Hindlimb ataxia
- Dribbling urine
- Usually remain bright and alert





Neurologic signs

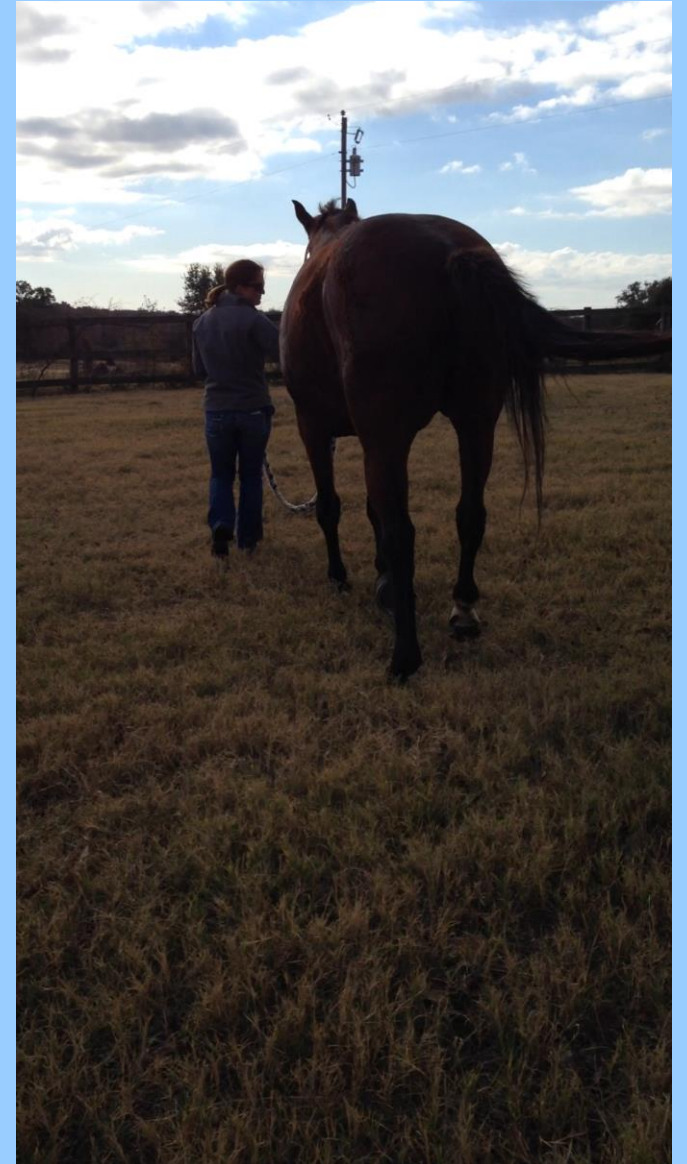
- If brain is affected
 - Blind
 - Head-pressing
 - Aggression
 - Seizures
 - Circling
 - “Mentally irregular” – Rocky Balboa

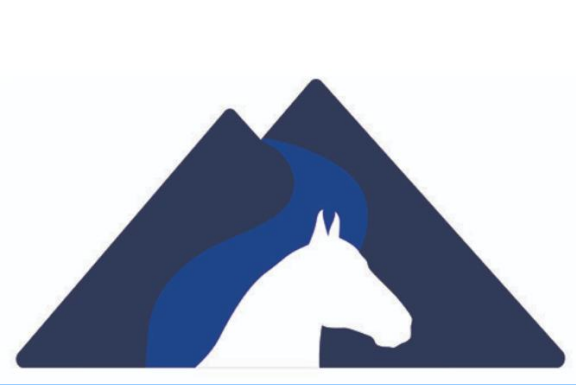




Neurologic signs

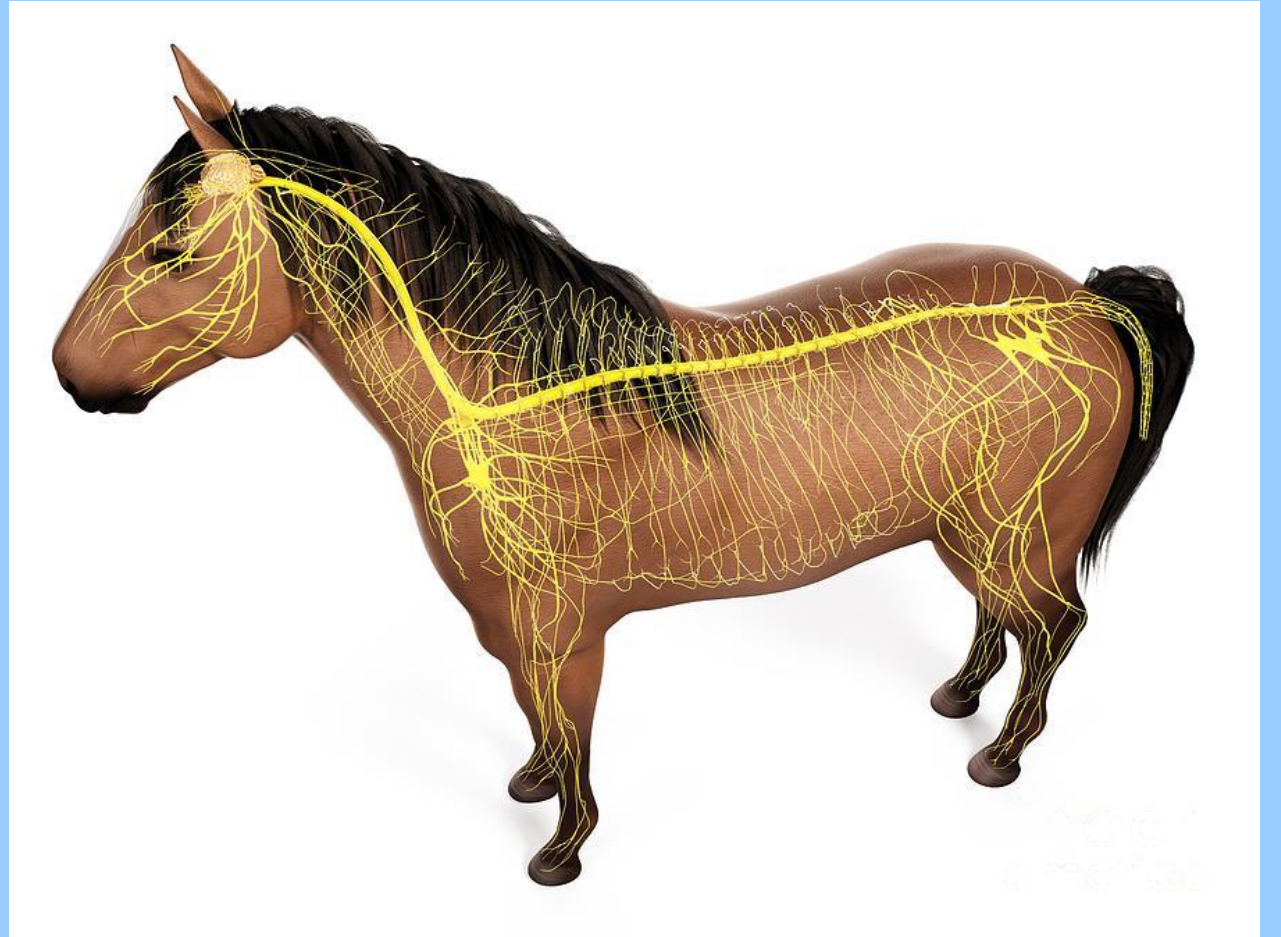
- If spinal cord affected
 - Ataxia/wobbly
 - Drunk walk
 - Weakness
 - Hypermetric gait (dancing gait)
 - Tripping
 - Difficulty standing
 - Down and can't stand up





Neurologic signs

- Others
 - Brain stem
 - Nerves outside the spinal cord
 - It's complicated...





Equine Herpes Virus

Abortions

- Late term, 3rd trimester
- Can occur as outbreaks

Early neonatal death

Chorioretinopathy (disease in eye)



Equine Herpes Virus

Sixth case of deadly equine virus confirmed in Flathead County

Vet: Churchill Downs herpesvirus outbreak holds at 6

California EHV-1 outbreak: six horses put down as competition is halted

2 horses dead after EHV-1 outbreak at Fonner Park



Equine Herpes Virus

What horses are at risk?

- Foals and yearlings RARELY affected by neurologic disease
- Older horses at increased risk of neurologic disease
- Horses in contact with other horses
 - Travel
 - New



Equine Herpes Virus

- Vaccination reduces viral shedding
- Vaccination will not prevent neurologic disease
- Seeking herd immunity
- Vaccinate every 6 months for at risk horses
- Don't vaccinate exposed horses



Equine herpes virus

Vaccination

- Intramuscular killed vaccine
 - Alone or as combination vaccine
 - EHV 1 and 4 *OR* EHV 1 alone





Streptococcus equi equi (Strangles)



Strangles

Bacterial respiratory infection

- **Fever, nasal discharge, enlarged lymph nodes, cough**
- Very contagious
- Spreads from horse to horse
 - Via respiratory/ocular secretions or fomites
 - Can have carrier with NO clinical signs



Strangles





Strangles





Strangles

- Complications
 - “Strangling”
 - Troubling swallowing
 - Guttural pouch chronic infection
 - Bastard strangles
 - Purpura hemorrhagica
 - Myositis
 - Pneumonia
 - Sinus infection





Strangles

Chronic carriers

- Chondroids in guttural pouch
- No clinical signs of illness
- Shedding infectious bacteria
- Can be source of outbreak





Strangles

- Vaccination
 - Modified live intranasal
 - Immunity starts at the upper respiratory tract
 - Risks associated with modified live
 - Killed intramuscular
 - Vaccinate annually
 - **DON'T VACCINATE EXPOSED HORSES**





Strangles

- Risks





West Nile Virus (WNV)

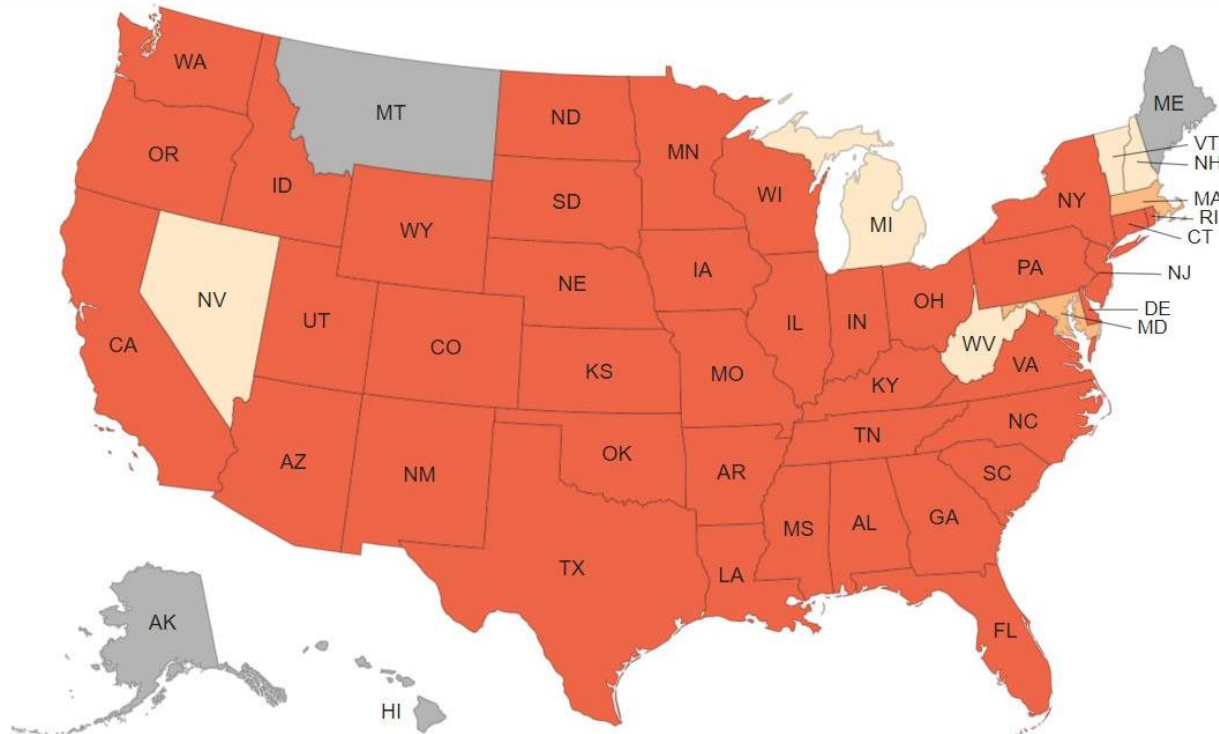


West Nile Virus

- Viral neurologic infection
 - Ataxia
 - Forelimbs affected more than hindlimbs
 - Brain can be affected
 - Tremors on face
 - **Spread by mosquitoes**
 - Horse is a dead end host



West Nile Virus



West Nile Virus Activity

- No reported WNV activity
- Non-human WNV activity
- Human WNV infections
- Human and non-human WNV infections

Territories

AS

GU

PR

VI

MP

FM

PW

MH





Eastern/Western Encephalitis (EEE, WEE)



EEE/WEE

- Viral neurologic infection
 - Clinical signs similar to WNV
 - Eastern worse than western
 - Spread by mosquitoes



Tetanus



Tetanus

- Bacterial toxin neurologic infection
 - *Clostridium tetani* (bacteria)
 - Found in manure, soil, rusty metals
 - Route of infection **via wounds**
 - Bacterial spores produce toxins
 - Toxins are what causes disease
 - Environmental factors promote spore formation (anaerobic)





Tetanus

- Clinical signs
 - Clenching teeth
 - Sardonic grin
 - Stiff neck
 - Prolapsing third eyelid
 - “Sawhorse” stance
 - “Pump handle” tail





Tetanus

- Toxoid vs anti-toxin
 - Toxoid
 - Stimulates immunity
 - Given as preventative
 - Anti-toxin
 - Neutralizes circulating toxins
 - No long-term immunity
 - Given as treatment if clinical disease or unvaccinated horse exposed





Rabies



Rabies

- Viral neurologic infection
 - All warm-blooded animals are susceptible
 - Reservoir animals
 - Skunks, racoons, bats, foxes, coyotes
 - Transmitted in saliva via bite wound
 - Fatal disease





Rabies

- Clinical signs in horses
 - 2 weeks to a year after exposure*
 - Average 4-8 weeks
 - Irritability
 - Self trauma
 - Drooling/trouble swallowing
 - Nervousness/pacing
 - Aggression
 - Colic
 - Lethargy/decreased appetite
 - Lameness/incoordination
 - Fever



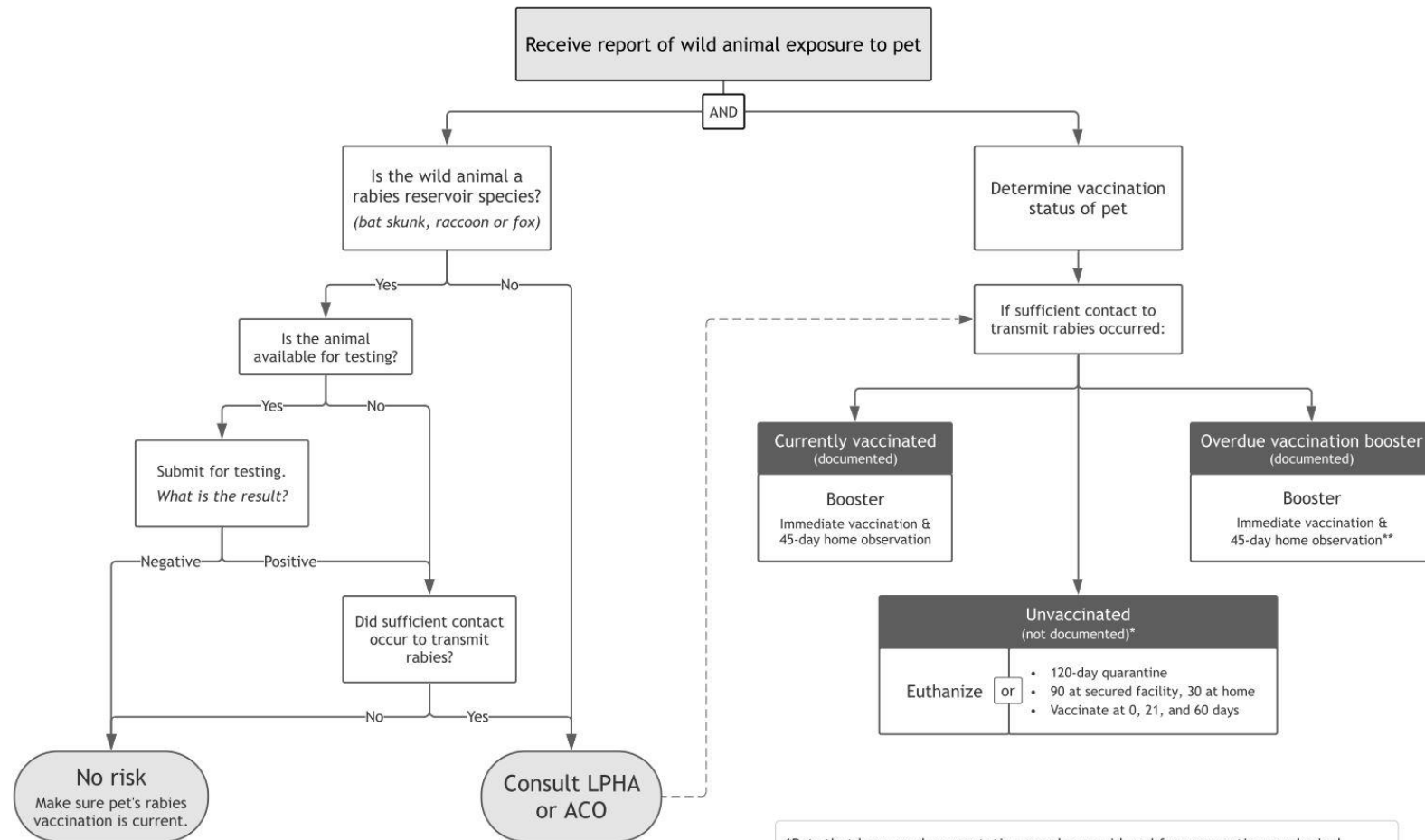


Rabies



CDPHE Rabies Prevention and Control Policy

Algorithm for Management of Domestic Animals Exposed to Wildlife

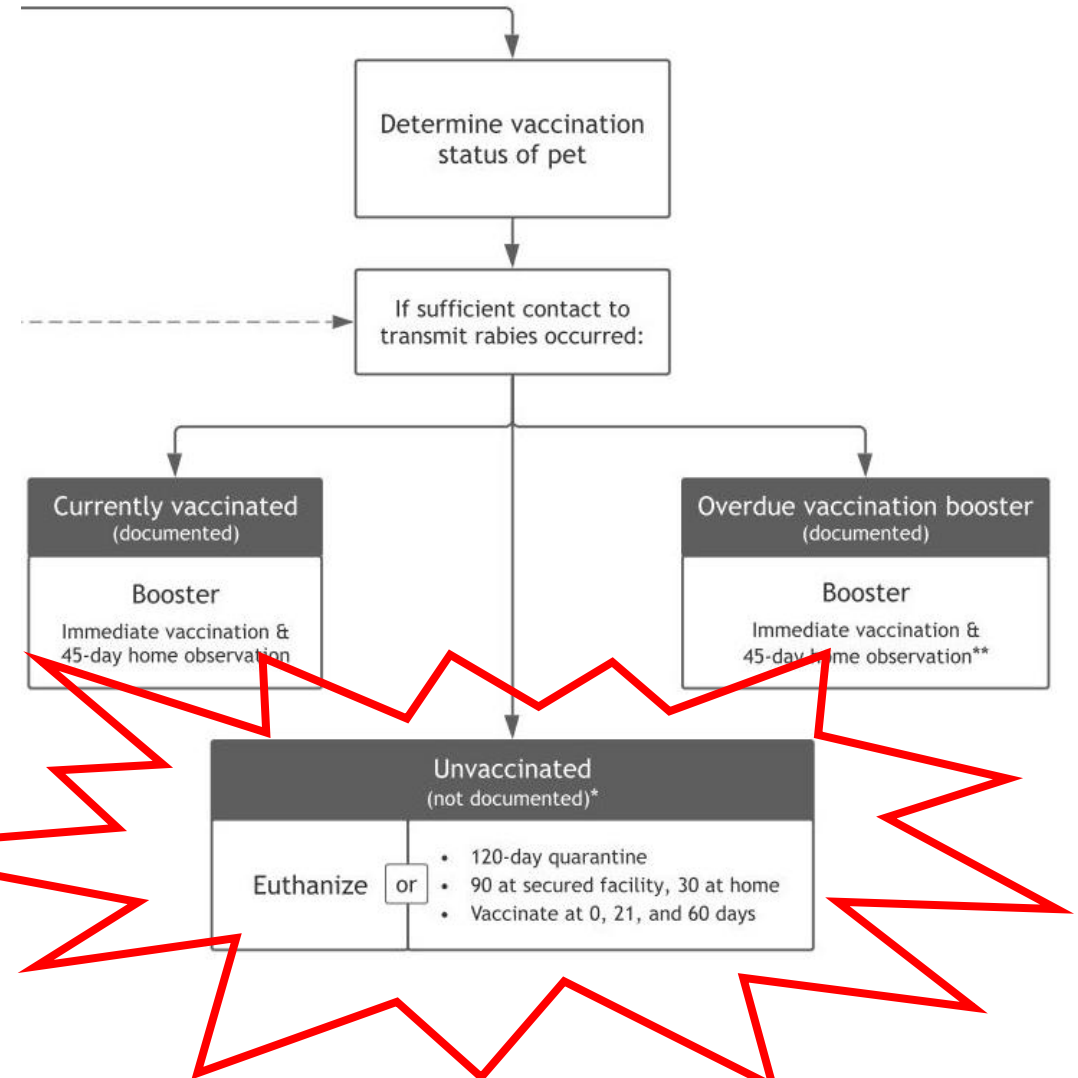


*Pets that have no documentation may be considered for prospective serological



Rabies

- Documentation to prove vaccination performed by veterinarian
- Otherwise considered unvaccinated by health officials





Vaccination in the horse

- Other disease that have vaccine available in horses – “Risk-based”
 - Botulism
 - Leptospirosis
 - Potomac horse fever (PHF)
 - Rotavirus
 - Equine viral arteritis (EVA)
 - Rattlesnake
 - Anthrax



Conclusions



Vaccination in the horse

- What horses benefit from vaccination
 - Environmental diseases

Rabies – 100% fatal¹
Acquired through the bite of an infected animal.

Tetanus – 75% fatal²
Caused by bacteria present in soil that can contaminate open wounds.

Eastern Equine Encephalomyelitis – 90% fatal¹
Transmitted to horses by mosquitoes that have fed on infected wild birds.

West Nile – 33% fatal¹
Acquired through the bite of a mosquito that previously fed on an infected bird.

Western Equine Encephalomyelitis – 50% fatal¹
Like Eastern equine encephalomyelitis, transmitted through the bite of an infected mosquito.



Vaccination in the horse

- What horses benefit from vaccination
 - Social diseases
 - Horses that interact with other horses
 - EIV
 - EHV
 - Strangles





Vaccination in the horse



Zoetis Equine Immunization Support Guarantee

Zoetis will support reasonable diagnostic and treatment costs up to \$5,000 if a horse properly vaccinated with one of Zoetis' 8 core or risk-based antigens contracts the corresponding equine disease:

CORE DISEASES VACCINATED AGAINST

- Eastern equine encephalomyelitis (EEE)
- Rabies
- Tetanus
- West Nile
- Western equine encephalomyelitis (WEE)

RISK-BASED DISEASES VACCINATED AGAINST

- Equine influenza
- Equine rhinopneumonitis (respiratory) caused by equine herpesvirus types 1 (EHV-1) and 4 (EHV-4)
- Venezuelan equine encephalomyelitis (VEE)



Questions?

