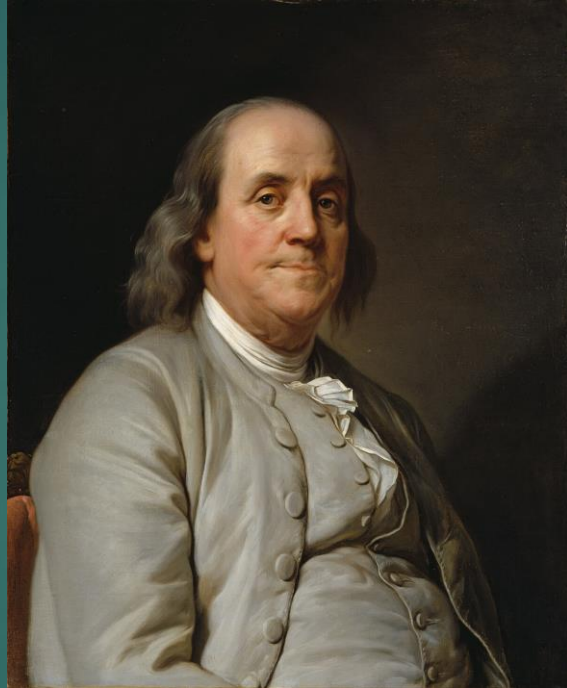


Vaccines

DR. SEAN ALLISON

CLEVELAND EQUINE CLINIC

Why do we vaccinate?



An ounce of prevention is worth a pound of cure
-Benjamin Franklin

What is a vaccine?

- ▶ Per Britannica a vaccine is a suspension of weakened, killed, or fragmented microorganisms or toxins or other biological preparation, such as those consisting of antibodies, lymphocytes or messenger RNA, that is administered primarily to prevent disease...
- ▶ Basically a weakened version of a disease that is given to promote an immune response and cause the body to create antibodies for that disease
- ▶ It causes an immune response but does not cause the disease itself

What can they protect and treat?

- ▶ Viruses
 - ▶ West Nile, Herpes 1-4, EEE/WEE
- ▶ Bacteria
 - ▶ Tetanus, strangles, botulism
- ▶ Fungus
 - ▶ Treatment of Equine Pythiosis
- ▶ Melanoma
 - ▶ Treatment of equine melanoma (Oncept)

Vaccine Types

- ▶ Live (attenuated)
 - ▶ Weakened form of disease
- ▶ Modified live
- ▶ Toxoid
- ▶ Recombinant
 - ▶ Uses small piece of bacteria or virus
- ▶ Inactivated/killed
 - ▶ Also use a piece or part of a virus/bacteria

A few facts

- ▶ Vaccines do NOT prevent an animal from contracting a disease, rather minimize the risk
- ▶ Immunity decreases with lack of proper vaccination
- ▶ Typically vaccines initially require a booster(s)
- ▶ Vaccines do not afford immediate protection to a disease
 - ▶ Plan accordingly
- ▶ Occasionally there can be reactions to the vaccine, very rarely can be severe
- ▶ <https://aaep.org/guidelines/vaccination-guidelines>
- ▶ [Home | Equine Disease Communication Center \(equinediseasecc.org\)](http://equinediseasecc.org)

Core Vaccines

- ▶ American Veterinary Medical Association (AVMA) defines as those that protect from disease that are endemic to a region, those with potential public health significance, required by law, virulent/highly infectious, and/or those that posing a risk of significant disease
- ▶ These types of vaccines show enough benefit and low enough level of risk to justify their use

Core Equine Vaccines

- ▶ West Nile Virus (WNV)
- ▶ Eastern and Western Encephalitis (EEE/WEE)
- ▶ Tetanus
- ▶ Rabies

Risk Based Vaccines

- ▶ Equine Influenza
- ▶ Equine Herpes 1-4 (Rhinopneumonitis) i.e. EHV 1-4
- ▶ Potomac Horse Fever (PHF)
- ▶ Strangles
- ▶ Botulism
- ▶ Leptospirosis
- ▶ Anthrax, Rotavirus, Snake bite, Venezuelan Encephalitis, Equine Viral Arteritis (EVA)

Broodmare Vaccination Schedule

- ▶ EHV 1 → Pneumabort
 - ▶ Give at 3, 5, 7, and 9 months
- ▶ Pre-foaling vaccines
 - ▶ Tetanus, WNV, EEE & WEE, Rabies, PHF, EHV 1/4
 - ▶ 4-6 weeks prior to foaling

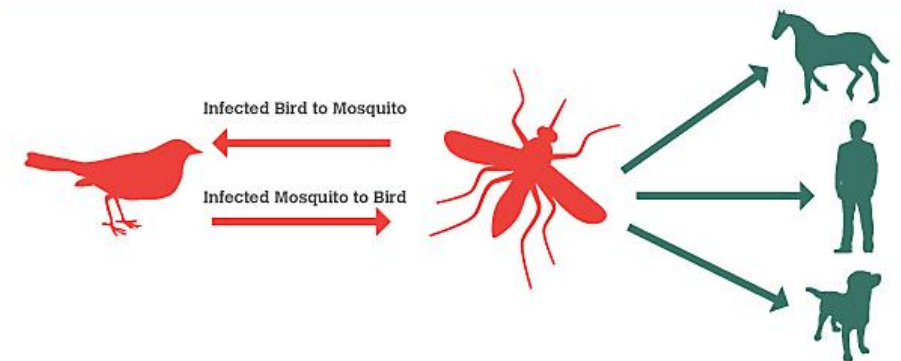
CEC Protocol

- ▶ Potomac Horse Fever (annual)
- ▶ Rabies (annual)
- ▶ Eastern/Western Encephalitis (annual)
- ▶ West Nile Virus (annual)
- ▶ Equine Herpes 1-4 (bi-annual)
- ▶ Influenza(bi-annual)
- ▶ Tetanus (*annual)

West Nile Virus

- ▶ Virus
- ▶ Leading cause of arboravirus encephalitis (inflammation of tissue of brain) in humans and horses
- ▶ Transmitted by mosquitos but carried by birds
- ▶ Not directly contagious from horse to horse
- ▶ Highly unlikely a horse with disease can pass to another horse via mosquito
- ▶ Vaccine- annually (spring)
 - ▶ Inactivated
 - ▶ Recombinant
- ▶ Diagnosed with blood or tissue sample

How West Nile Virus Is Transmitted



West Nile Virus Clinical Signs

- ▶ Neurologic signs
 - ▶ Hind limb weakness, circling, muscle fasciculations, impaired vision, inability to swallow, hyperexcitability, paralysis, seizures, death
- ▶ Loss of appetite
- ▶ Depression (impaired mentation)
- ▶ Fever
- ▶ Blindness



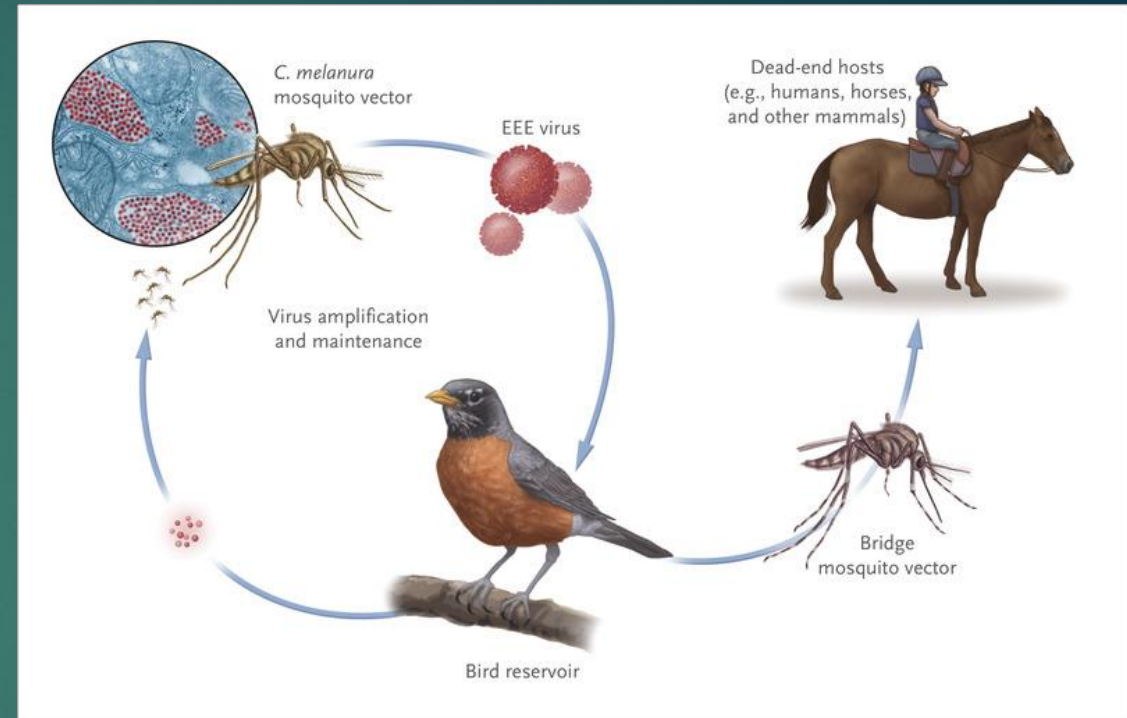
West Nile Treatment

- ▶ Supportive care
 - ▶ Fluids
 - ▶ Oral/intravenous feeding
- ▶ Anti inflammatory drugs
- ▶ Slings



Eastern & Western Equine Encephalitis

- ▶ Transmitted via mosquito
- ▶ Virus
- ▶ Birds are reservoir
- ▶ Horses dead end host (as are people)
- ▶ EEE fast acting and highly fatal
- ▶ WEE less deadly compared to EEE
- ▶ Vaccine- annually (spring)
 - ▶ Killed
- ▶ Diagnosed by blood test or cerebral spinal fluid (CSF)



WEE and EEE Clinical Signs

- ▶ Fever
- ▶ Impaired vision
- ▶ Depression
- ▶ Ataxia
- ▶ Head pressing
- ▶ Paralysis
- ▶ Convulsions
- ▶ Coma and death

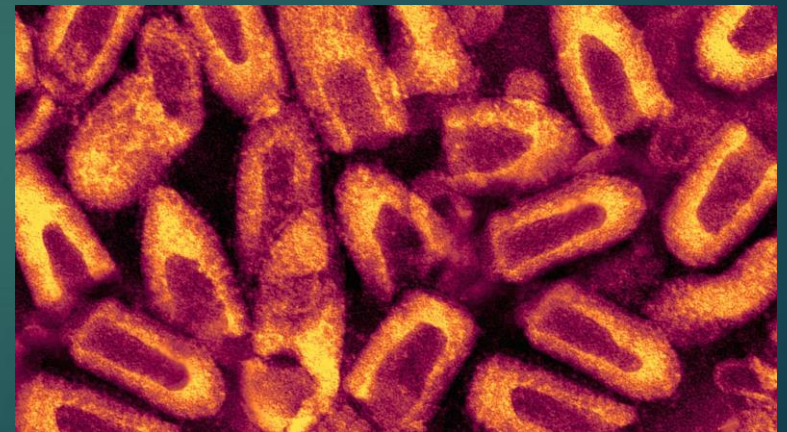


EEE and WEE Treatment

- ▶ Supportive care
- ▶ Corticosteroids

Rabies

- ▶ Virus
- ▶ Zoonotic
- ▶ Carried by mammals and passed via bites, scratches, and saliva
- ▶ Horses are very susceptible but relatively rare
- ▶ Once clinical signs seen, death is typically inevitable
- ▶ Reportable disease in the US
- ▶ Vaccine
 - ▶ inactivated



Rabies Clinical Signs

- ▶ Ataxia and muscle weakness
- ▶ Sensitivity to touch
- ▶ Loss of sensory perception
- ▶ Fever
- ▶ Self mutilation
- ▶ Aggressive behavior
- ▶ Drooling and inability to swallow
- ▶ Death
- ▶ Furious vs paralytic (stuporous) form**



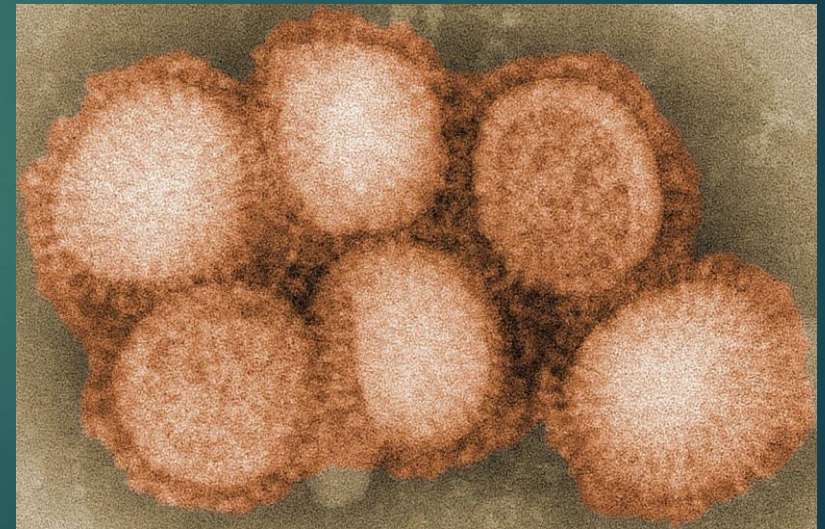
Rabies treatment

- ▶ No treatment
- ▶ IF properly vaccinated post vaccine booster dose needed



Equine Influenza

- ▶ One of the most common respiratory diseases of horses
- ▶ Virus
- ▶ Highly contagious
- ▶ Transmitted via coughing, droplets and fomites
- ▶ Diagnosed via nasal swab PCR
- ▶ Vaccine options
 - ▶ Inactivated given in muscle
 - ▶ Modified live given intranasal



Equine Influenza Clinical Signs

- ▶ Virus effects cells of throat and causes horse to be susceptible to bacterial infection
- ▶ Fever
- ▶ Nasal discharge
- ▶ Cough
- ▶ Lethargy and loss of appetite



Equine Influenza Treatment

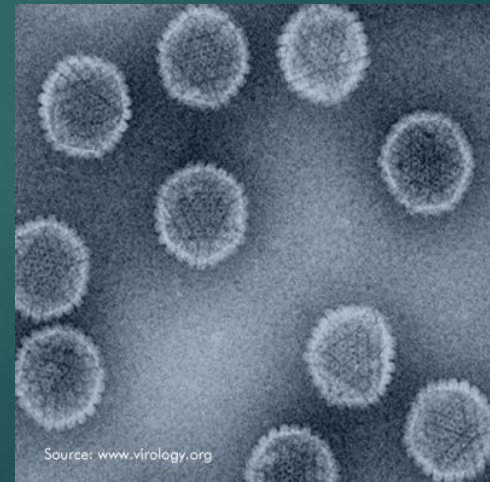
- ▶ Supportive care
- ▶ Treatment of secondary bacterial infection

ANTIBIOTICS



Equine Herpes 1 & 4

- ▶ Rhinopneumonitis
- ▶ Virus
- ▶ Many horses may be infected with EHV 1 early on in life and lies latent
 - ▶ Some studies say 80-90%
- ▶ Can vary from subclinical to severe
- ▶ EHV 1 can cause abortion in mares as well as mutate into Equine Herpes Myeloencephalopathy (EHM)
- ▶ Spread via direct contact or fomites
- ▶ Vaccines
 - ▶ Inactivated
 - ▶ Modified live
- ▶ Diagnosed nasal swab or blood test



EHV 1-4 Clinical Signs and Treatment

- ▶ Biphasic fever
 - ▶ Peaking at 1-2 days and then again at 6 days
- ▶ Enlarged lymph nodes
- ▶ Discharge from eyes and nose
- ▶ Typically not much of a cough
- ▶ Treatment includes supportive care



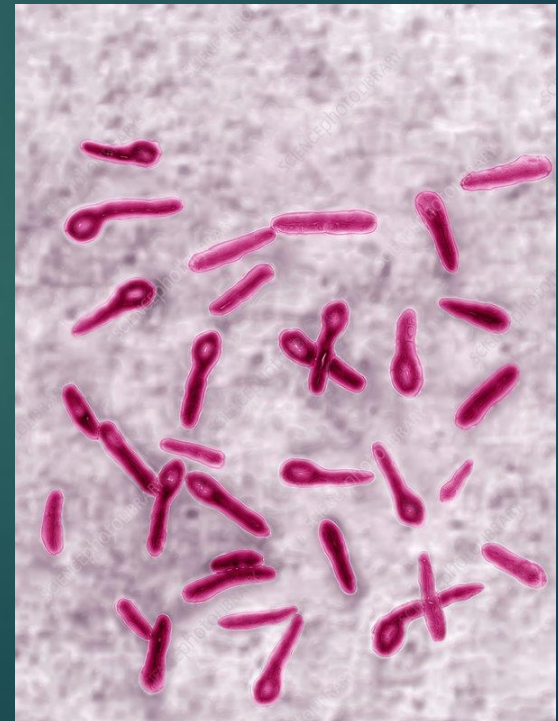
EHM

- ▶ Equine Herpes Myeloencephalopathy
- ▶ Form of EHV 1 (and rarely EHV 4)
- ▶ Signs start approximately 7 days post infection
 - ▶ Incubation typically 2-10 days
- ▶ Can cause incoordination, weakness, urine dribbling, head tilt, fever, loss of tail tone, inability to rise
 - ▶ Typically starts at hind end and moves forward
- ▶ **IMPORTANT** to remember that the EHV 1-4 vaccine does not protect against the neurologic form
- ▶ Can be diagnosed by blood test or nasal swab
 - ▶ Important to not to screen for EHV 1
- ▶ Treatment includes supportive care



Tetanus

- ▶ Bacteria Clostridium tetani, neurotoxin
- ▶ Also called “lock jaw”
- ▶ Attacks nerves controlling muscles and causes muscle stiffness and spasm
- ▶ Live in GI tract of horses as well as in the soil
- ▶ Not contagious between horses
- ▶ Comes from punctures, wounds, surgical incisions
- ▶ Vaccine- annually
 - ▶ Inactivated, toxoid
- ▶ Diagnosed by clinical signs or culture



Tetanus Clinical Signs

- ▶ Stiffness and difficulty moving, “saw horse” appearance
- ▶ Third eyelid protrusion especially when startled
- ▶ Tail may stick out
- ▶ Loud sounds and bright lights can worsen symptoms
- ▶ May have “anxious” look as facial muscles stiffen
- ▶ Inability to open mouth (lock jaw)
- ▶ May die from respiratory failure (diaphragm cannot move)

Tetanus



Tetanus Treatment

- ▶ Antibiotic (typically penicillin)
- ▶ Tetanus antitoxin
- ▶ Typically kept in dark quiet stalls that may be padded
- ▶ If disease is significant enough a sling may also be used

Potomac Horse Fever

- ▶ *Neorickettsia risticii* (bacteria)
- ▶ Late spring to early fall but can be seen later into year
 - ▶ Have had diagnosed cases in December in this region
- ▶ Ingest aquatic insects that have bacteria inside them (typically mayfly)
- ▶ If found on farm it will mostly occur in the future
- ▶ Vaccine-annually
 - ▶ Killed (many times combined with Rabies)
- ▶ Diagnosed by blood or feces



PHF Clinical Signs

- ▶ Fever
- ▶ Colitis/diarrhea
- ▶ Laminitis
- ▶ Abortion in pregnant mares



PHF Treatment

- ▶ Antibiotics
- ▶ Anti-inflammatories
- ▶ Anti-diarrhea medications
- ▶ Treatment of laminitis
- ▶ Fluid therapy



Strangles

- ▶ *Streptococcus equi subspecies equi* (bacteria)
- ▶ Horse infected via inhalation or ingestion
- ▶ Highly contagious
- ▶ Diagnosed by blood, or culture/swab/tracheal wash
- ▶ Currently an intra-muscular and intra-nasal vaccine
- ▶ Discussion of whether horses should be vaccinated for strangles
 - ▶ Many horses may have contracted the disease early on in life. Pulling a titer in older horses may be more ideal.

Strangles Clinical Signs

- ▶ Fever
- ▶ Nasal discharge
- ▶ Lymph node swelling and/or abscessation
 - ▶ Especially in the jaw area
- ▶ Purpura hemorrhagica
- ▶ “Bastard” strangles
 - ▶ Metastatic abscessation in other lymph nodes in the body



Strangles Treatment

- ▶ Isolation
- ▶ Antibiotics
 - ▶ Penicillin
 - ▶ Ceftiofur
- ▶ Anti-inflammatories
- ▶ Tracheotomy

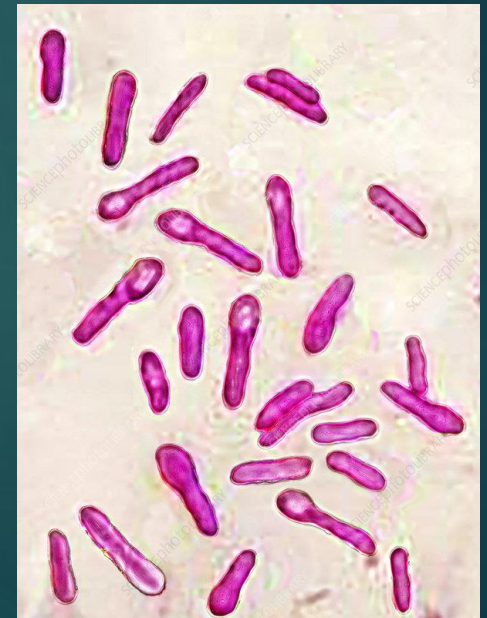


Purpura hemorrhagica

- ▶ Sequela to strangles
- ▶ Swelling of head, legs and under belly
- ▶ Blood vessels swell to immune response to strangles
- ▶ Treatment include corticosteroids, antibiotics, tracheostomy in advanced cases
- ▶ Difficult to predict cases
- ▶ If horse has had previous reactions to strangles vaccine recommend not doing again

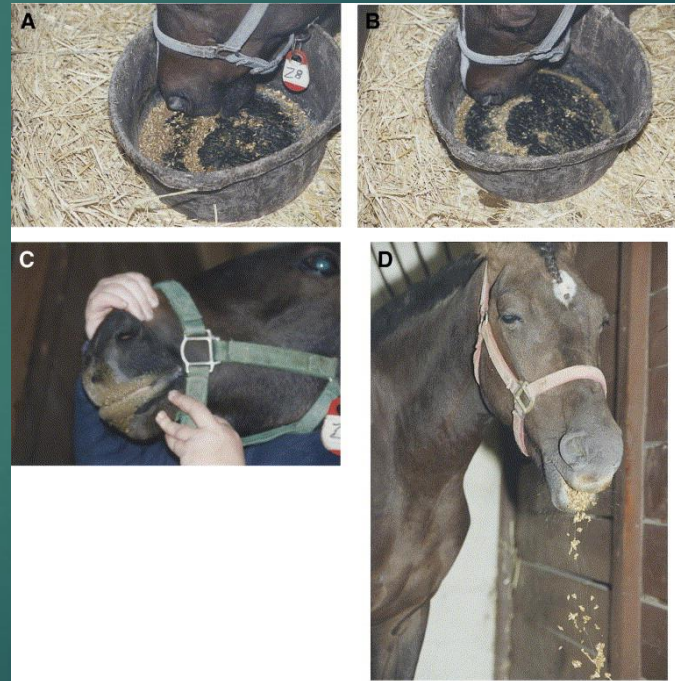
Botulism

- ▶ *Clostridium botulinum*
- ▶ Can be found in soil and decaying animals
- ▶ Hay can be contaminated
- ▶ Horse is infected by ingestion or less likely a wound
- ▶ “Shaker foal syndrome”
- ▶ 8 types (A,B,C effect horses)
- ▶ Diagnosed off clinical signs and history (no blood test etc.)



Botulism Clinical Signs

- ▶ Flaccid paralysis
 - ▶ Eyelids/tongue
 - ▶ Difficulty standing
 - ▶ Bladder paralysis and colic
 - ▶ Paralysis of respiratory system
- ▶ Normal mentation*

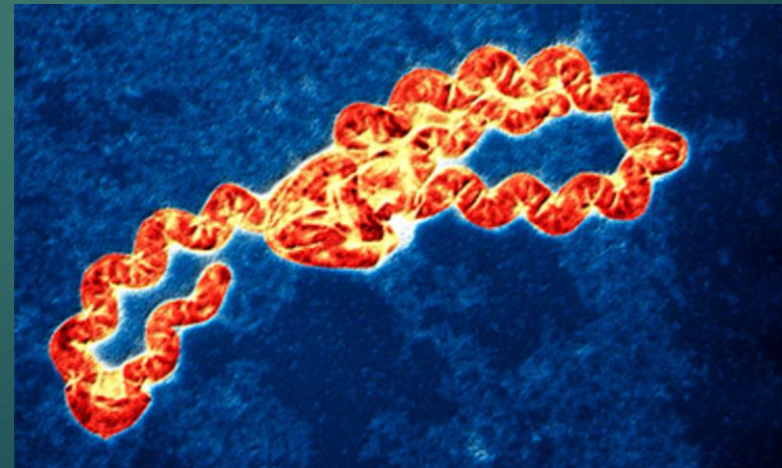


Botulism Treatment

- ▶ Antitoxin (\$\$\$)
- ▶ Supportive care
- ▶ Mechanical ventilation in foals

Leptospirosis

- ▶ *Leptospira* bacteria (*pomona*, *interrogans*)
- ▶ **Zoonotic** (passed through urine)
- ▶ Can be infected via mucus membranes of mouth, eyes, or nose with urine
- ▶ Also infected via cuts or scratches
- ▶ Can also be ingested
- ▶ Diagnosed by blood or other tissues



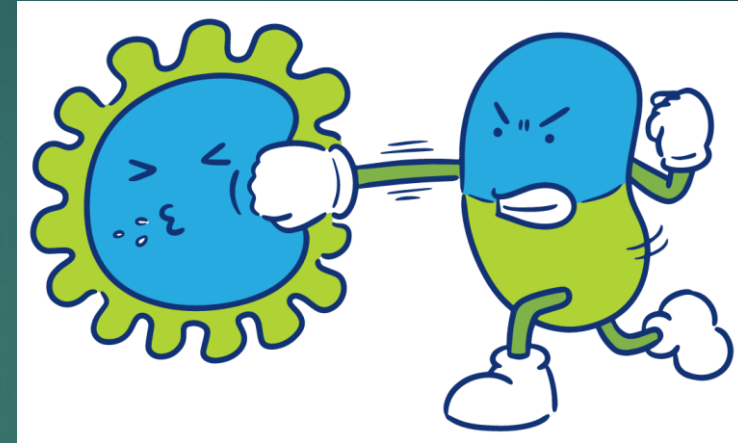
Leptospirosis Clinical Signs

- ▶ Fever
- ▶ Depression
- ▶ Lack of appetite
- ▶ Uveitis (moon blindness)
- ▶ Severe infections can cause kidney and liver issues and potentially death
- ▶ Abortion



Leptospirosis Treatment

- ▶ Antibiotics
- ▶ Treatment of uveitis

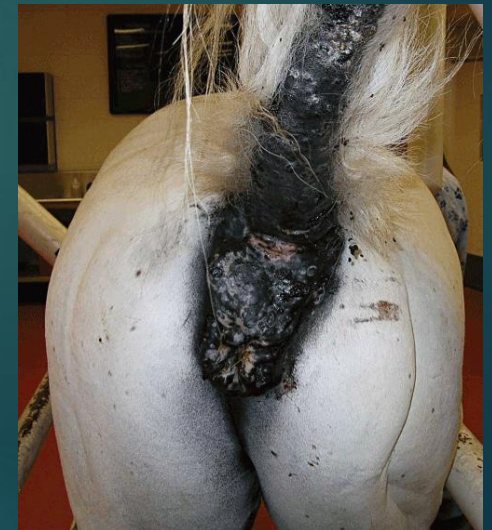


Equine Melanoma

- ▶ Common nodular tumors typically found in grey horses
- ▶ May or may not be malignant
- ▶ Can develop at any age
- ▶ Melanoma in non grey horse should be considered much more dangerous
- ▶ Can occur around mouth, eyes, sheath, vulva, behind jaw, internal organs
- ▶ Malignant form can be more severe and effect horse to greater extent

Equine Melanoma

- ▶ Varied size of black “bumps”
- ▶ Firm swelling particularly in the jaw area
- ▶ Can break open and ooze a black substance
- ▶ Can be locally invasive which may cause more severe issues
 - ▶ Colic
 - ▶ compression of spinal cord
 - ▶ not allow penis to retract
 - ▶ cause horse to have difficulty passing manure



Equine Melanoma

- ▶ Oncept
 - ▶ Made for oral melanoma in dogs
 - ▶ Stimulates body to mount immune response against melanoma



Equine Melanoma



Equine Pythiosis

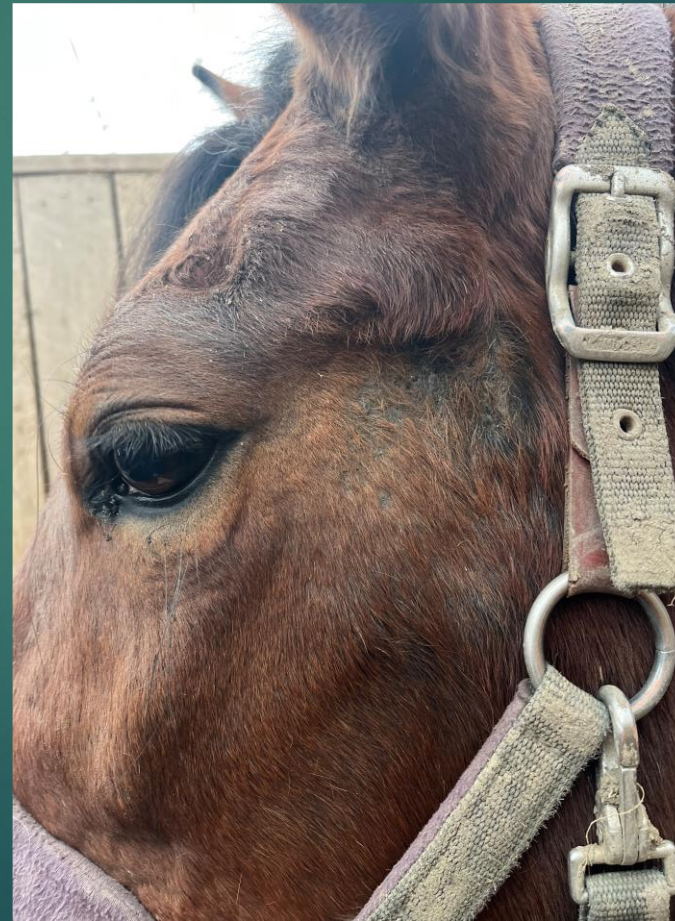
- ▶ *Pythium insidiosum*
- ▶ “Swamp cancer”
- ▶ Fungus like infection that can affect skin, bones, intestines etc.
- ▶ Wounds develop kunker (not canker)
- ▶ Diagnosed by presentation or blood test
- ▶ Cannot be spread from horse to horse
- ▶ Vaccine can help acute as well as chronic cases
- ▶ **Has also some application of being used to help equine sarcoids

Equine Pythiosis



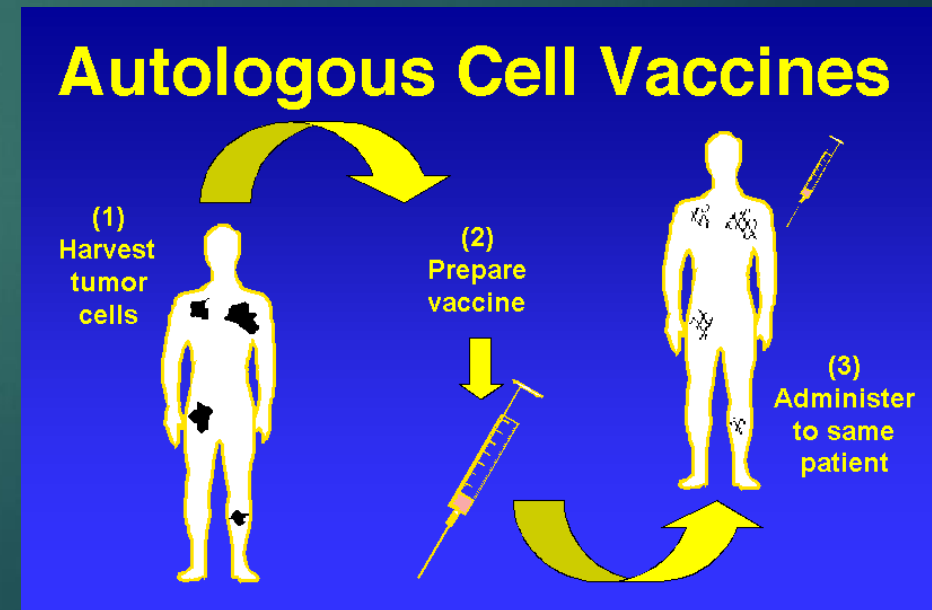
Equine Pythium Vaccine

- ▶ Treatment of sarcoids



Autologous Vaccines

- ▶ Immunotherapy
- ▶ Equine Melanoma
 - ▶ Sample of melanoma removed and sent to specialty lab and made into injectable vaccine
- ▶ Torigen
 - ▶ Melanoma, sarcoid, squamous cell carcinoma
 - ▶ Administered once a week for 6 weeks



Equine Infectious Anemia

- ▶ Coggins test
- ▶ Swamp fever
- ▶ Virus (lentivirus)
- ▶ Potentially fatal blood borne disease causing persistent infection (life long carriers)
- ▶ Can affect horses, ponies, zebras, donkeys, mules and found worldwide
- ▶ Passed by biting flies (i.e. horsefly, deerfly)
- ▶ Edema, weight loss, anemia, depression, petechia, epistaxis, death, fever



Equine Infectious Anemia

- ▶ No treatment
- ▶ No vaccine
- ▶ With testing has dropped from 4% to .004%
- ▶ If a horse is confirmed positive:
 - ▶ Euthanasia
 - ▶ Quarantine at least 200 yards from any equid species for life

Biosecurity & Isolation

- ▶ When in doubt contact veterinarian
- ▶ New arrivals to facility isolate for 7-14 days
- ▶ When disinfecting know your products
 - ▶ Bleach/alcohol vs Accel/Rescue, Intervention
- ▶ Isolation of suspect infected animal(s)
- ▶ Foot baths, protective clothing, independent cleaning items and tack
- ▶ Serial testing

Questions?

