EQUINE INFLUENZA

Definition

Equine influenza virus is a RNA virus which is endemic in horse populations in many countries worldwide and which occurs sporadically in epidemic form from time to time. Countries free of equine influenza include Iceland, Australia and New Zealand. Outbreaks are possible and occur in endemic countries.

Clinical Signs

- Fever up to 106°F (41.1°C), depression, anorexia, muscle pain/weakness
- Dry, harsh cough (sometimes paroxysmal) usually precedes fever. The dry, harsh cough is a frequent clinical sign in EI while it is less common with EHV infection. Cough can last up to 6 weeks after other clinical signs have abated. Can take up to 6 months to regain previous athletic abilities
- Nasal discharge is initially serous, but rarely may become mucopurulent with secondary bacterial infections
- Secondary bacterial infections are very common in influenza affected horses
- Slightly enlarged retropharyngeal lymph nodes
- May be more severe in donkeys and mules

Rare clinical signs can include distal limb edema and cardiomyopathy.

Clinical signs are usually present 3-5 days after exposure (i.e. 3–5 day incubation period)

Clinical signs are more common, and more severe, in younger horses; ages 1–5yo. Older horses usually have milder disease.

Incubation Period

Frequently as short as 24 hours and may be up to 3 days.

Risk Factors

- Areas of high comingling of horses such as race tracks, show grounds, veterinary hospitals
- Immunosuppression from traveling, hospitalization, training and showing
- Age: horses 1–5 years of age

Vaccinated horses can still be infected and shed the virus (subclinical shedding). Source

Transmission

- Respiratory transmission (most common)
  - Inhalation of infective droplets from coughing and snorting horses (may be able to spread as far as 50 yards by this route)
  - Respiratory shedding typically lasts for 7–10 days post infection in naïve animals; much shorter shedding periods occur in partially immune horses (previously vaccinated horses)
- Indirect transmission can occur and can be an important means of spread. This includes transmission of the virus on clothing, equipment, brushes, shared water buckets, hands, etc.

Diagnostic Sampling, Testing and Handling

- **Virus isolation from nasopharyngeal swabs**
  - Samples should be collected within 24–48 hours after clinical onset. Swabs should be submitted in viral isolation transport media (NOT bacterial transport media). If no viral transport media is available, place swabs in a red top tube with a few sterile saline drops. Ship on ice. Nasopharyngeal or Nasal Swab Collection

- **Real time PCR (RT-PCR) from nasopharyngeal swabs** (EDTA blood is NOT an acceptable sample)
  - Will often only detect certain strains, i.e. H3N8, H3N8, or H1N1. Must be submitted as a viral isolation sample, see above (see Cornell Vet Diagnostic Lab)
- Immunoassay—stall-side kit
- Antigen capture ELISA
- Serology—paired (acute and convalescent) sera can be very useful in confirming a diagnosis of the disease. Acute sample should be taken as close to onset of clinical signs (max of 3–5 days) as possible and the convalescent sample should be taken 2 weeks later. Serology can confirm infection even with a false negative virus isolation. Submit separated serum samples (clot must be removed) in a red top tube. Serum samples are stable at room temp for several days; longer requires refrigeration or freezing

Post-mortem

It is very rare that equine influenza infection would result in a fatal outcome. Thus, there are few reports of the gross pathologic findings. Based on original studies of influenza, changes include bronchiolitis, peribronchiolitis and subacute interstitial pneumonia.

Practitioners performing necropsies in the field are encouraged to contact a veterinary diagnostic laboratory to which they plan to submit samples for further testing, such as histopathology and pathogen identification in order to be certain they collect the appropriate samples and handle the samples in a

	manner that will optimize making a definitive diagnosis. For some situations, such as neurologic cases, submission of the entire carcass to the diagnostic laboratory for post-mortem examination is recommended due to the time and labor required to perform a complete exam and collection of samples from the equine CNS.
Shedding of Virus Following Resolution of Clinical Signs	Probable for 7 days, possible up to 10 days. (In most cases, virus shedding is no longer occurring by the time clinical signs resolve—the shedding period is 7–10 days post infection; not post resolution of clinical signs.)
Environmental Persistence	• Virus can remain viable for up to 2 days on contaminated fomites and solid environmental surfaces like stall latches • In water, virus viability has been reported up to 3 days. (Viability in water is temperature dependent; accordingly, viability may be longer than 3 days in cold water. Freezing water may inactivate virus • Can survive in aerosols for several hours and on hands for a few minutes (Weber, TP and Stilianakis NI. 2008. Inactivation of influenza A viruses in the environment and modes of transmission: A critical review. Journal of Infection. Volume 57. Issue 5. pp 361–373)
Specific Control Measures	Biosecurity Guidelines Vaccination • Booster vaccination of healthy animals in primary and secondary contagion control perimeters is likely to be of value, and is not known to result in complications. While annual vaccination is currently recommended, more frequent vaccination is recommended for young horses and specific equestrian facilities and organizations that require more frequent (biannual) vaccination • If animals are unvaccinated prior to an outbreak, the use of a modified live intranasal vaccine is recommended as this can achieve protection within 5 days of primary administration AAEP Vaccination Guidelines Isolation and Biosecurity • Any horse showing clinical signs of any respiratory disease should be immediately isolated and standard respiratory biosecurity guidelines should be followed until a diagnosis is confirmed Release of animals from isolation: • Maintain isolation procedures (primary perimeter) for 21 days after resolution of last suspect case of new infection.

Biosecurity Issues for Receiving Animals	For horses having been housed within a primary perimeter (i.e. any horse housed in a barn with a horse that showed respiratory clinical signs): • Isolate from the general equine population for 14 days For other horses: • Vaccination requirements may be considered when disease risk is elevated • Certificate of Veterinary Inspection (CVI) specifications - disclaimer regarding disease exposure within a specified interval of time Isolate all horses returning from shows, exhibitions, or trail rides for 10–14 days.
Disinfection	Easily killed by many disinfectants. Antec Virkon S with potassium peroxymonosulfate and sodium chloride killed EIV regardless of time, temperature or presence of organic matter. (Yamanaka T, Bannai H, Tsujimura K, Nemoto M, Kondo T, and Matsumura T. 2014. Comparison of the Virucida Effects of Disinfectant Agents against Equine Influenza A Virus. Journal f Equine Veterinary Science. Vol 34, Issue 5. pp 715–718. Alcohol hand sanitizers are effective against influenza viruses. Source
Zoonotic Potential	None known, but strains of H3N8 virus can infect canines. Evidence implicating duck and equine influenza viruses as possible progenitors of the Hong Kong strain of human influenza: W.G. Laver, R.G. Webster: Virology Volume 51, Issue 2, February 1973, Pages 383-391 and Studies on the content of antibodies for equine influenza viruses in human sera: N. Masurel and J. Mulder: Bull World Health Organ. 1966; 34(6): 885–893. Equine Influenza has also been isolated from a camel: https://wwwnc.cdc.gov/eid/article/20/12/14-0435_article The OIE document on EI also states: There is little risk to public health. In experimental settings, the virus has shown the ability to infect humans, and a few people in contact with infected horses developed antibodies to equine influenza viruses, but no humans exposed to the virus have become ill. Reference Another OIE reference states: While equine influenza has not been shown to cause disease in humans, serological evidence of infection has been described primarily in individuals with an occupational exposure to the virus. During 2004–2006 influenza surveillance in central China (People's Rep. of) two equine H3N8 influenza viruses were also isolated from pigs. Source