

Equine Strangles

a.k.a Distemper

Agent: Strangles is caused by *Streptococcus equi*, a gram-positive, capsulated bacterium that is easily transmitted and seen worldwide.

Brief Description: Strangles is characterized by abscessation of lymph nodes of the head and neck. Common clinical signs include: thick yellow discharge from nostrils and eyes, swollen and often abscessation of submandibular and/or retropharyngeal lymph nodes, difficulty in swallowing, fever up to 106° F, depression with decreased appetite, and coughing. Strangles gets its descriptive name because swollen lymph nodes may cause airway obstruction and death due to compression of the pharynx, larynx, and trachea.

A chronic form known as “Bastard Strangles” may occur when abscesses develop in unusual areas in the body, such as the abdomen or chest cavity. Significant danger occurs when these abscesses rupture. “Bastard Strangles” occurs due to immune system failure or overwhelming and rapid spread of the bacteria throughout the body.

According to the 2005 American College of Veterinary Internal Medicine (ACVIM) Consensus Statement of Strangles, clinical disease will confer “strong and enduring” immunity in approximately 75% of horses. Strong immunity may last 5 - 11 years. Around 20 - 30% of horses infected for the first time will become susceptible to re-infection within a few months, presumably because of an inadequate immune response. These horses usually become strongly immune on second infection. In populations of horses that do not have a naïve group of horses introduced every year, Strangles outbreaks occur every decade or so, as a significant majority of horses may no longer be strongly immune.

Strangles is more common in juvenile equine; however, horses, donkeys, and mules of all ages that lack adequate immunity from previous infection or vaccination may be affected. Nearly 100% of the animals in an exposed herd may be infected, but the mortality rate of strangles is typically 8.1%. Death is generally attributed to nervous system infections, pneumonia, or abscesses developing in the internal organs. Purpura hemorrhagica is a rare and sometimes fatal acute autoimmune disease causing generalized vasculitis as a sequela to Strangles vaccination or disease exposure. Other possible complications are muscle infarctions and rhabdomyolysis with progressive muscle atrophy.

Differential Diagnoses:

- Epizootic Lymphangitis
- Ulcerative Lymphangitis
- Dourine
- Melioidosis
- Equine Viral Rhinopneumonitis
- Equine Influenza
- Equine Viral Enteritis

Reservoir/Host Species: Horses may symptomatically recover from the disease, but continue to be infectious for prolonged periods through periodic shedding. These sub-clinical carriers which occur in approximately 10% of affected equine become sources of infection to susceptible animals. Introduction of these equine into a herd may be the underlying cause of an outbreak.

Mode of Transmission: Infection is spread by ingestion or via respiratory route by direct inhalation of purulent discharges. It may spread for at least 4 weeks after the initial exposure due to the organism developing resistance to diverse environmental conditions. Indirect transmission may occur when equine share contaminated housing, water sources, feed or feeding utensils, twitches, and tack. The clothing and equipment of handlers, caretakers, farriers, and veterinarians may serve as fomites in transmission.

Incubation Period: The incubation period is typically 3 - 12 days and the disease normally runs its course in 2 - 4 weeks. However, equine may shed the bacteria from 4 weeks to as long as 8 months after clinical signs resolve. Therefore, affected animals should be isolated from unexposed equine for prolonged periods. Convalescing equine can become chronic carriers.

Diagnosis: Culture of nasal swabs, nasal washes, or pus from abscesses is essential for confirming the presence of *S. equi*. It usually takes 24 – 48 hrs after the onset of fever for *S. equi* to become detectable in the mucosa. Thus, culture may fail to detect the organism during the incubation period, and in early clinical phases. A combined effort using Polymerase Chain reaction (PCR) and culture increases the carrier detection rate.

The Athens and Tifton diagnostic laboratories use PCR and culture as a means of identifying *S. equi*. Both tests are run five days per week. The results for PCR are usually ready 24 - 48 hrs and *S. equi* identification on cultures are available 3 - 5 days later. Culture samples should be taken using bacterial culturettes that are refrigerated and then shipped overnight with icepacks. To perform a nasal wash instill about 50 mL of warm normal saline via a 15-cm length of soft rubber tubing (5-6 mm diameter), insert to the level of the nasal canthus and collect the washings. The laboratory will centrifuge the washings, and culture the pellet. PCR results will either be reported as positive (+) or negative (-). If *S. equi* is found on a culture, a sensitivity test will be run and its abundance will be identified as heavy, medium or light growth.

Hyperfibrinogenemia is typical of both the acute and chronic disease. Leukocytosis with neutrophilia and hyperproteinemia attributable to a polyclonal gammaglobulinemia is characteristic of metastatic and chronic abscessation.

Confirmation of difficult cases involves endoscopic examination of the upper respiratory tract (including the guttural pouches), ultrasonography of the retropharyngeal area, or radiographic examination to determine the location and degree of retropharyngeal abscesses or chondroids.

For further information concerning sample submission, contact the Athens Diagnostic Laboratory at (706) 542-5568 or the Tifton Diagnostic Laboratory at (229) 386-3340.

Prevention Measures/Control: Strangles can be prevented from spreading by taking the following precautions: vaccinate equine based upon a veterinary risk assessment and

recommendations; isolate new equine for 30 days before introducing them to the herd; and examine any newly isolated equine with a nasal discharge. During isolation, monitor temperature twice daily and laboratory test equine with a temperature greater than 102.5° F or clinical signs consistent with Strangles. Manure from infected equine should be composted in an area where other equine will not be exposed to the manure or water run off. Pastures where infected equine were housed should be rested for four weeks. Water troughs should be cleaned and disinfected at least daily during an outbreak. All stalls and equipment should be cleaned with a detergent solution, rinsed with clean water, allowed to dry, and then sprayed with a disinfectant that is effective against *Streptococcus species*. Exposed wood should then be allowed to dry after disinfection and be further sealed with preservative or paint.

Vaccine: There are currently two types of vaccines available on the market: a killed M protein extract and modified live intranasal vaccine. Extract vaccines are given intramuscularly (IM), initially in two doses, 2-3 weeks apart followed by an annual booster. The American Association of Equine Practitioner's (AAEP) Guidelines recommends that mares that are previously vaccinated be boosted with a killed vaccine at 4-6 weeks prepartum. AAEP recommends that foals at a high risk of infection be vaccinated with a killed M protein extract in a three dose series starting at 4-6 months of age with a 4-6 weeks interval between doses. The Modified live intranasal product may be used at 6-9 months of age in a two dose series at three week interval. Examples of M protein extract vaccines include: Strepvax II[®], Strepguard[®], and Equivac 2 in 1[®], and Equivac-S[®].

Modified live intranasal vaccines produce local antibodies necessary for protective immunity. Pinnacle[®] I.N. is provided by Fort Dodge, and is the first intranasal vaccine available in the United States. Initially, a 2 ml dose is placed in one nostril, and a second dose is applied 2 - 3 weeks later. This vaccination is live and attenuated (less virulent strain of *S. equi*), thus special precautions must be taken to avoid contamination of injection sites of other medications given at the same time. Concurrent vaccination/injection may result in abscess formation of the site; therefore, other injections and/or vaccinations should be administered prior to handling the intranasal vaccine. Modified live intranasal vaccines should only be used in healthy animals free of clinical signs of strangles.

Any horse that shows signs of strangles, or was infected within the previous year should not be vaccinated. Also if an outbreak were to occur, only horses with no known exposure with strangles infected horses or their exudates should be promptly vaccinated. Vaccination in the face of an outbreak should only occur under specific veterinary recommendation due to the fact that you may cause a worse outbreak.

Zoonotic Risk: Zoonotic transmission has been reported, but is uncommon. Immuno-compromised individuals should avoid exposure to Strangles.

Reporting Requirements: Any person who makes a clinical diagnosis or a laboratory confirmation of Strangles in an animal shall report it by the close of the next business day to the State Veterinarian's office at (404) 656-3667 or (404) 656-3671 in Atlanta, or 1-800-282-5852 outside of Atlanta, or to the USDA Area Veterinarian in Charge at (770) 922-7860.

Electronic References:

American Association of Equine Practitioners. Risk-based Vaccination Guidelines: Strangles (Streptococcus equi)

<http://www.aaep.org/strangles.htm>

American College of Veterinary Internal Medicine Consensus Statement. *Streptococcus equi* Infections in Horses: Guidelines for Treatment, Control, and Prevention of Strangles

http://www.acvim.org/uploadedFiles/Consensus_Statements/Strangles.pdf

Indiana Animal Disease Diagnostic Laboratory: Strangles

<http://www.addl.purdue.edu/newsletters/2003/Spring/strangles.shtml>

Institute for International Cooperation in Animal Biologics. An OIE Collaborating Center, Iowa State University College of Veterinary Medicine. Fact Sheet: Streptococcus

<http://www.cfsph.iastate.edu/Factsheets/pdfs/compiledDiseases.pdf>

The Merck Veterinary Manual, 50th Anniversary edition

<http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/121309.htm&word=strangles8>

Ontario Ministry of Agriculture, Food and Rural Affairs. Fact Sheet: Strangles in Horses

<http://www.omafra.gov.on.ca/english/livestock/horses/facts/03-037.htm>

Wyeth Pharmaceuticals, Pinnacle[®] I.N.

http://www.wyeth.com/products?product=/wyeth_html/home/products/animal_health/Pinnacle%20IN/Pinnacle%20IN_overview.html

Other References:

Sellon, Debra C. and Long, Maureen T.; Equine Infectious Diseases, Saunders, 2007.