

Strangles:



Basic Guidelines for Horse Owners

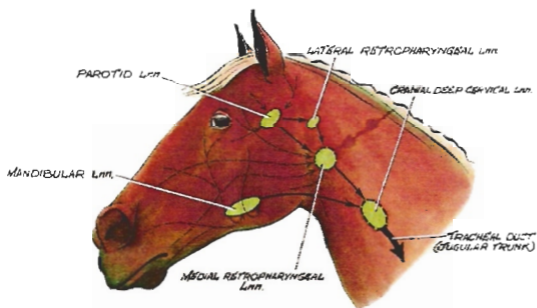
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What clinical signs might my horse present if it has strangles?

Strangles is caused by the bacteria *Streptococcus equi* subspecies *equi*, and commonly manifests as fever, mucopurulent nasal discharge, and swelling with subsequent abscessation of submandibular and retropharyngeal lymph nodes. Fever is the most common initial clinical sign, and may continue as the lymph nodes swell and abscesses mature.

Horses also often appear listless and depressed, and may experience pharyngitis, laryngitis, and rhinitis (inflammation of the mucous membranes of the nose), accompanied by bilateral nasal discharge. Pharyngitis can contribute to dysphagia (difficulty swallowing) and consequently, horses may become reluctant to eat, and can be observed standing with their necks in extension.



LYMPH NODES OF PAROTID, MANDIBULAR, AND RETROPHARYNGEAL LYMPHOCENTRES AND CRANIAL PART OF DEEP CERVICAL LYMPHOCENTRE OF HORSE'S HEAD.

The submandibular and retropharyngeal lymph nodes are consistently involved in strangles disease progression. Hot, diffuse, painful edema can be succeeded by release of serum from the skin, and, if abscess maturation occurs, the lymph nodes may rupture to drain a creamy pus that does not have a foul odor.

It is important to note that lymph node abscesses (retropharyngeal lymph nodes in particular), do not always drain externally, and the swelling may not be appreciable externally either. Retropharyngeal lymph nodes may drain into the guttural pouch and create guttural pouch empyema (pus accumulation). The guttural pouches are paired air filled sacs located on top of the pharynx containing several large vessels and nerves.

Abscessation of retropharyngeal lymph nodes can also potentially obstruct the upper respiratory tract, compressing the pharynx, larynx, or trachea in more severe cases.

How long after exposure will my horse begin to show clinical signs?

The incubation period of strangles is 3 to 14 days, and the first indicator of infection is an abrupt elevation in temperature. Nasal shedding of *Streptococcus equi* most often occurs 2 to 3 days after the onset of fever.



How is strangles transmitted between horses?

Horses that have not mounted a sufficient immune response, and are therefore susceptible, can become infected with through direct or indirect contact with the secretions of horses with active and recovering strangles. These secretions may or may not be visible.

Direct transmission occurs between horses that are housed together, or have potential for contact over fence lines, while indirect transmission can result from exposure to water, housing, feed, tack, or other materials (including the clothing of handlers) that have been contaminated by infected horses. These items may remain contaminated for 2 months if not adequately disinfected.

How will my Veterinarian diagnose strangles in my horse?

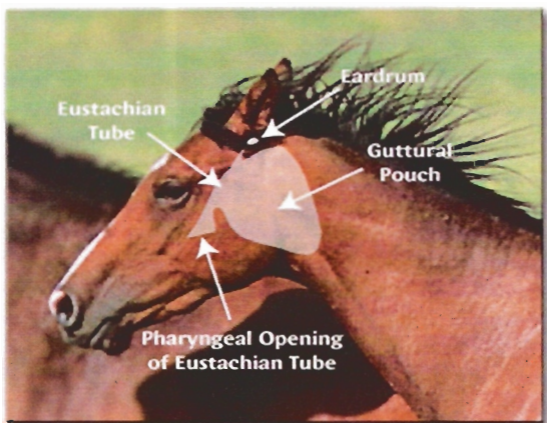
Strangles diagnosis is most often based upon clinical signs and the isolation (culture) or DNA detection (PCR) of *S. equi* subsp *equi* from nasal swabs, nasal washes, pus aspirated from abscesses, or lavage fluid obtained from the guttural pouches.

How long after resolution of clinical signs will a horse continue to be a source of infection?

In the majority of horses, *S. equi* is no longer detectable 4 to 6 weeks after full recovery, thus, it should be assumed that an affected horse may be shedding the organism for 6 weeks after its clinical signs have abated.

The exception to this scenario occurs with horses that can be classified as long term, subclinical carriers. This means that the animal persists as a source of infection through periodic shedding and can therefore serve as a source of new outbreaks if introduced into a susceptible herd.

The carrier state may develop in up to 10% of affected horses, and is most often associated with chronic infection of the guttural pouches. Following rupture of the retropharyngeal lymph nodes into the guttural pouch, the purulent material that is released can potentially form masses known as chondroids. Chondroids can maintain *S. equi* infections that, in some horses, can persist for months to years. Horses with guttural pouch infection may cough intermittently or display unilateral nasal discharge.



If my horse has successfully recovered from strangles, is it now protected?

The majority of horses acquire solid immunity following an episode of strangles that continues for 5 years or longer in over 75% of animals.

Are there vaccinations available and when should I vaccinate my horse?

Several vaccines are currently available and include:

- Strepguard with Havlogen (a *S. equi* extract),
- Strepvax II (a *S. equi* extract)
- Pinnacle I.N. (an attenuated live culture of *S. equi*).

Extract vaccines are administered intramuscularly or subcutaneously and generate serum antibody responses following a period of 7 to 10 days. The vaccination protocol involves a schedule of 2 to 3 doses separated by 2 week intervals, as well as an annual booster. Pregnant mares can be boosted one month prior to expected foaling date. Pinnacle (attenuated live vaccine) adheres to a similar schedule of administration, but is delivered intranasally. Development of immunity following vaccination takes approximately 2 weeks.

Vaccination is not a risk free endeavour, and both safety and efficacy issues exist. Parenteral (extract) vaccines induce sufficient bactericidal activity systemically, but these antibodies are not necessarily protective, due to the significant role that mucosal immunity plays in resistance to infection. The attenuated live intranasal vaccine stimulates both systemic as well as local mucosal responses, but adverse reactions such as fever, inappetance, lymph node abscessation, intramuscular abscesses, and a condition known as purpura hemorrhagica can still occur. Purpura hemorrhagica is an immune mediated condition involving inflammation of vessels, and is characterized by hemorrhage and edema. In addition, because the intranasal vaccine contains live *S. equi*, if remote sites on the animal are contaminated, this can result in abscess formation at these locations. Consequently, no other vaccinations should be given concurrently.

It is suggested that only those horses with no known contact with infected or exposed animals should be vaccinated. If necessary, it is possible to assay the antibody levels of horses in order to determine if vaccination poses a sufficient risk.

What measures can be used to control strangles transmission on my premises if an outbreak occurs?

1. Stop the movement of horses on and off the premises, and, if possible, isolate those horses with strangles (as well as their contacts) within a segregated "dirty" area.

2. In order to determine if horses are infectious following resolution of clinical signs, 3 nasopharyngeal swabs, washes, or lavages can be taken at weekly intervals and tested for the presence of *S. equi*. Horses that maintain a negative status can then be considered “clean”. If feasible, the establishment of clean and dirty areas provides a systematic means of transferring recovered, non-infectious animals into an area where nonaffecteds are kept.
3. To facilitate detection, segregation, and potential treatment of new cases, rectal temperatures should be taken daily.
4. In order to limit cross-infection between groups of horses strict hygiene protocols should be established:
 - Handlers should use protective clothing dedicated to infectious animals and should not work simultaneously with unaffected animals until disinfected and a change of clothes has been provided
 - Only specified equipment should be used for infectious animals, and the equipment should be thoroughly disinfected between animals
 - Manure, waste feed, and shavings from infectious animals should be maintained and composted in an isolated location
 - Pastures used to house infectious animals should be rested for 4 weeks before animals are reintroduced
 - Water troughs should be consistently disinfected
 - Wood surfaces can be soaked in liquid disinfectant and subsequently treated with a wood preservative
 - A conscious effort should be made to remove visible organic material from the stables, and soak surfaces in a liquid disinfectant

What is the appropriate treatment for horses with strangles?

Dependent on the stage and severity of the disease, the majority of strangles cases do not require extensive drug management. Horses presenting with fever and depression can be treated with a 3 to 5 day course of antibiotics, but it is probable that these animals will remain vulnerable to reinfection, as protective immunity has not been established. Introduction of antibiotic therapy into the management of horses with lymph node abscessation is likely contraindicated. In this scenario, use of antibiotics may serve to delay the enlargement and rupture of the abscesses, and the animal may experience a return to abscessation following discontinuation of the medication. Treatment of asymptomatic horses with antibiotics may result in treatment failure, or delay of onset of clinical signs.

Antibiotic inclusion within a treatment plan is warranted when the horse is febrile, depressed, anorexic, and is displaying difficulty breathing as a consequence of partial upper airway obstruction. Antibiotic therapy will aid in decreasing the size of abscesses and thus avoid complete airway obstruction.

Those horses with guttural pouch empyema can be repeatedly lavaged using endoscopically guided instruments, and elimination of *S. equi* from the guttural pouches can be achieved through a combination of flushing and aspiration as well as infusion of a gelatin/penicillin solution.

Does the age of the horse contribute to disease severity?

Disease severity is highly dependent on the immune status of the individual. Older horses that have likely been previously exposed may display mild clinical signs such as cough and nasal discharge, while younger horses are more susceptible to developing lymph node abscessation. If mares produce adequate colostral antibodies due to recovery or vaccination, foals that suckle these immune mares are most often protected until weaning.

How long after recovery can my horse be ridden?

Healing of the respiratory tract requires a period of 2-3 weeks, and they remain contagious for a month. Consequently, you risk contamination of riding arenas, tack, and other surfaces if you attempt to ride them before shedding has ceased. Riding should be postponed if coughing, noise when breathing, or reluctance to work is observed.

Do complications associated with *S. equi* infection exist?

The overall complication rate associated with strangles infection is relatively low (approximately 20%). Complications are most often associated with the dissemination of infection from the head and neck to other regions of the body, immune-mediated processes such as purpura hemorrhagica and muscle disease, as well as agalactia in broodmares (a failure to produce milk).

Infection caused by the bacteria *Streptococcus equi* subspecies *equi*, commonly known as Strangles, was first reported in 1251 and has remained a potentially devastating disease world-wide.

Although the young and old are the hardest hit, any age horse can succumb to Strangles. Clinical signs of Strangles occurs 3 to 14 days after the horse comes in contact with the bacteria.

These signs can range in severity from mild depression to severe life threatening infections. The most common presentation includes swelling of the submandibular lymph nodes, nasal discharge, and fever.

Shedding of the bacteria usually begins at the time the fever begins and can continue for 3 weeks there after. For this reason, voluntary quarantine of affected horses and properties should be imposed for 4 to 6 weeks during an outbreak.

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