Strangles

Streptococcus equi subspecies *equi* (*S. equi*) is the bacterium which causes the highly contagious disease strangles (also known as “distemper”). Strangles commonly affects young horses (weanlings and yearlings), but horses of any age can be infected. Vaccination against *S. equi* is recommended on premises where strangles is a persistent endemic problem or for horses that are expected to be at high risk of exposure. Following natural infection, a carrier state of variable duration may develop, and intermittent shedding may occur. The influence of vaccination on intermittent shedding of *S. equi* has not been adequately studied.

The organism is transmitted by direct contact with infected horses or sub-clinical shedders, or indirectly by contact with water troughs, hoses, feed bunks, pastures, stalls, trailers, tack, grooming equipment, nose wipe cloths or sponges, attendants’ hands and clothing, or insects contaminated with nasal discharge or pus draining from lymph nodes of infected horses. *Streptococcus equi* has demonstrated environmental survivability particularly in water sources and when protected from exposure to direct sunlight and disinfectants and can be a source of infection for new additions to the herd.

Infection by *S. equi* induces a profound inflammatory response. Clinical signs may include fever (102-106^{o} F); dysphagia or anorexia; stridor; lymphadenopathy (+/- abscessation); and copious mucopurulent nasal discharge.

Following natural or vaccinal exposure to streptococcal antigens, certain individuals may unpredictably develop purpura hemorrhagica, an acute, non-contagious syndrome caused by immune-mediated, generalized vasculitis. Clinical signs develop within 2 to 4 weeks following natural or vaccinal exposure to streptococcal antigens. Clinical signs may include urticaria with pitting edema of the limbs, ventral abdomen and head; subcutaneous and petechial hemorrhage; and sloughing of involved tissues. Severe edema of the head may compromise breathing. Immediate medical attention should be sought for individual horses suspected of having purpura hemorrhagica.

S. equi and *S. equi* subspecies *zooepidemicus* are antigenically similar organisms. However, exposure to, or vaccination against, one does not confer reliable immunity to the other.

Vaccines:

Strangles vaccines are considered “risk-based” vaccines. Vaccination is an effective method of disease control in individuals and in populations, however, vaccination in the face of an outbreak should be carefully considered, as there is significantly increased risk of adverse reactions in exposed horses. Purpura hemorrhagica can be associated with vaccine administration. SeM titers can be measured before vaccination with the goal to identify individuals at risk of developing complications from vaccination. Outbreak mitigation and the prevention of spread of *S. equi* infection are centered on management of horses, personnel, and facilities.

(View AAEP *S. equi* Infectious Disease Control Guidelines; view ACVIM Strep equi consensus statement)

Killed vaccine:

A killed vaccine can be an adjunct to the prevention of strangles. A reduction in clinical attack rate of only 50% was reported in vaccinates a few weeks after the final booster. Adverse reactions include soreness or abscesses at injection sites and occasional cases of purpura hemorrhagica.

The injectable, inactivated *S. equi.* vaccine can be associated with an increased rate of injection site reactions as compared to other equine vaccines. Due to the limited variability between commercially available vaccinal bacteria and field isolates, autogenous bacterins are not advocated.

Modified live vaccine:

An intranasal, modified live bacterial vaccine product has been shown to stimulate a high level of immunity against experimental challenge. The inductive sites are the pharyngeal and lingual tonsils. Vaccinal organisms must reach these sites in sufficient numbers to trigger protective responses; therefore, accurate vaccine delivery is critical to vaccine efficacy. After administration of the modified live vaccine a small number of horses may experience **noncontagious** transitory upper respiratory signs including nasal discharge or lymphadenopathy, especially in animals less than 2 years of age.

Nasopharyngeal wash samples may be positive on PCR for up to 6 weeks after administration of the attenuated live vaccine strain. Culture of nasopharyngeal wash samples may grow the vaccine strain for a few days following IN vaccine administration.

In order to avoid inadvertent contamination of other vaccines, syringes and needles, it is advisable and considered a good practice to administer all parenteral vaccines (IM) or other injectables *before* the handling and administration of the modified live intranasal vaccine against *S. equi*.

Vaccination Schedules:

Adult horses previously vaccinated: Vaccinate annually based on risk assessment and manufacturers' recommendations.

Adult horses unvaccinated or having unknown vaccinal history:

Killed vaccine:

Manufacturers' recommendations are for primary vaccination with a series of 3 doses administered parenterally at intervals of 3 weeks, followed by annual revaccination or prior to anticipated exposure. Annual revaccination is recommended.

Modified live vaccine:

Manufacturer's recommendations are for a primary vaccination series of 2 doses administered intranasally at an interval of 2-3 weeks between doses. Annual revaccination is recommended.

Broodmares previously vaccinated:

Killed vaccine:

Annual vaccination based on risk. May consider vaccinating 4 to 6 weeks pre-partum for foal protection when at high risk.

Modified live vaccine:

Annual vaccination based on risk.

Broodmares previously unvaccinated or having unknown vaccinal history:

Killed vaccine:

Administer parenterally 3-dose primary series at 3-week intervals. Final dose may be administered 4 to 6 weeks pre-partum for foal protection when at high risk.

Annual vaccination based on risk.

Modified live vaccine:

Administer intranasally a 2-dose primary series with a 3-week interval. Annual vaccination based on risk.

Foals:

Killed vaccine:

Administer a 3-dose series at intervals of 3 weeks between doses. Foals vaccinated when less than 3 months of age should receive an additional dose at 6 months. Annual vaccination is recommended.

Modified live vaccine:

Administer intranasally at 9 months of age a 2-dose primary series with a 3-week interval between doses. Administration of this products in foals less than 9 months of age is considered off label use. Practitioners are cautioned when using product off label. Annual revaccination is recommended and should commence at 12 months of age.

Horses having been naturally infected and recovered: Following recovery from strangles, most horses develop a durable immunity, persisting in over 75% of animals for 5 years or longer. This indicates that stimulation of a high level of immunity is biologically feasible given appropriate presentation of protective immunogens. Currently, a diagnostic test (SeM Antibody ELISA) can be used before vaccination with the goal to identify individuals at risk of developing complications from vaccinations (those with titers >1:3200). Titers against SeM do not indicate protection from infection. Additional testing information is available from; ACVIM Strep equi consensus statement.

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