



Strategy to eradicate and prevent Strangles (STEPS)



The Disease

The equine disease Strangles is characterised by an elevated temperature followed by the formation of abscesses in the lymph nodes of the head and neck. Strangles was first described in 1251 and the causative bacterium, *Streptococcus equi* (*S. equi*), was identified in 1888.

The lymph node abscesses are usually large, painful and can make swallowing and even breathing difficult and distressing for the horse. As abscesses burst, they release highly infectious pus into the local environment, allowing transmission of *S. equi* to other horses. Abscesses can also burst internally and there can be other complications, which together lead to the death of 1 to 2 % of infected horses.

Despite the severity of Strangles, the vast majority of horses make a complete recovery. However, around one in ten of these apparently healthy animals remain persistently infected, usually carrying *S. equi* in their guttural pouches (air sacs in the back of the throat). These carriers are a major risk to other horses as they can shed *S. equi* and trigger new outbreaks. However, we can prevent outbreaks by identifying and treating carriers before they transmit the infection to new horses.

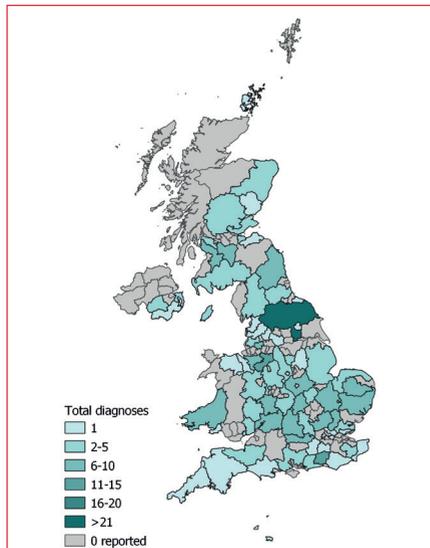


Nasal discharge (pus) draining from abscesses in a case of Strangles

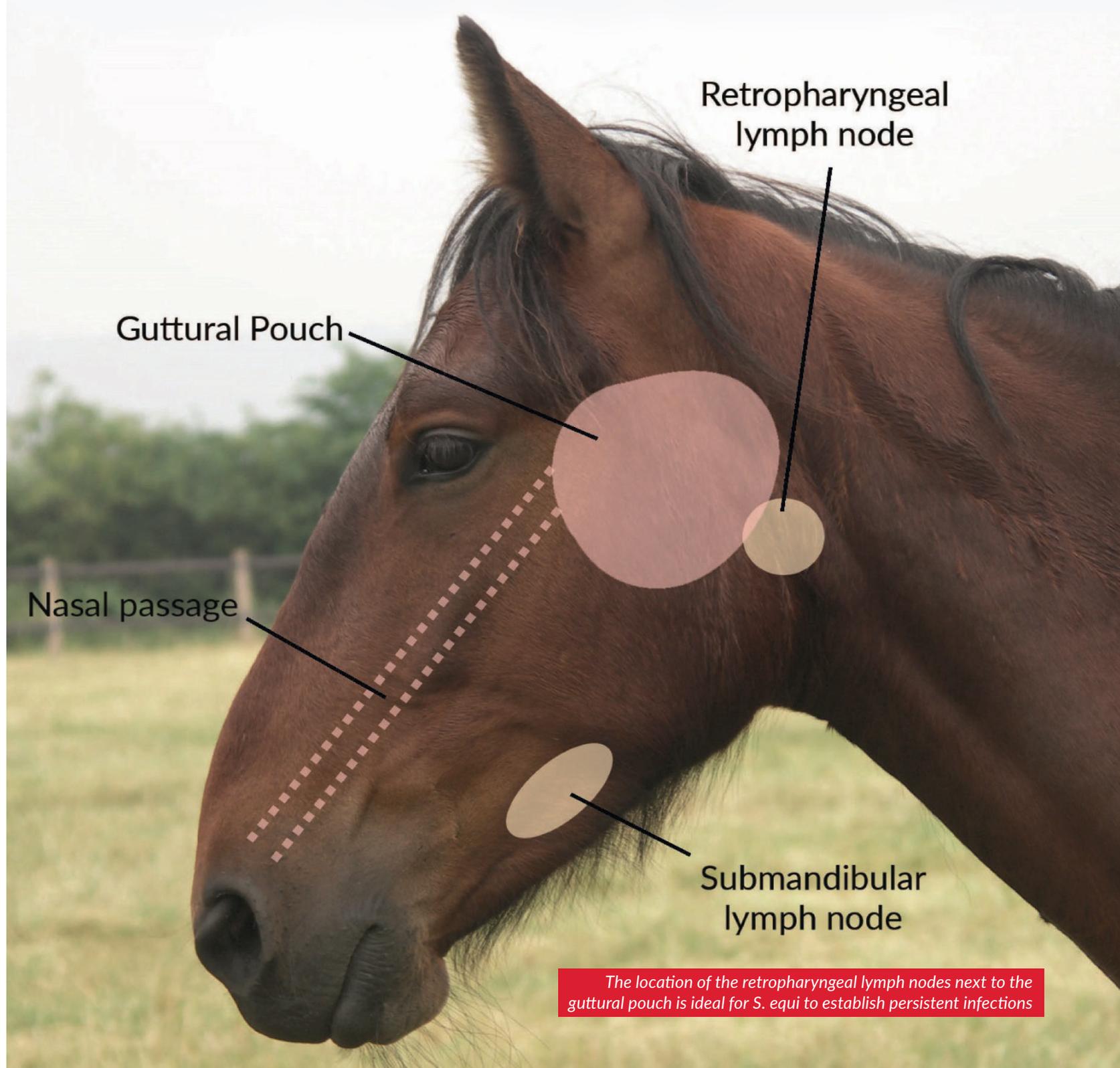
Does Strangles affect all horses?

Strangles remains one of the most frequently diagnosed infections of horses worldwide, with the notable exception of Iceland where a ban on the importation of horses has been maintained for over 1,000 years. Over 600 outbreaks are estimated to occur throughout the UK each year, which are often linked to the movement of one or more horses.

Strangles can affect any age, sex or breed of horse and remains a widely feared disease because of its debilitating effects and its potential economic impact on equestrian businesses. Strangles is not solely a disease of poor welfare and the risk of a horse contracting Strangles cannot be completely eliminated. However, there are practical steps that can be taken to help minimise the risk, reduce the impact and prevent the recurrence of Strangles if the disease does strike.



Frequency of reported laboratory diagnoses of *S. equi* across divisions of the UK during 2019



The location of the retropharyngeal lymph nodes next to the guttural pouch is ideal for *S. equi* to establish persistent infections

1. Spread the word...not the disease!

There is no legal requirement to notify government authorities about an outbreak of Strangles, but affected establishments are strongly encouraged to advise neighbouring equine premises of an outbreak to reduce the risk of spread. It is also important to inform the relevant national breeders' associations to help them to identify if other yards should be alerted. The British Horseracing Authority should also be informed if Strangles is identified in racehorses during training or competition. A nationwide Surveillance of Equine Strangles (SES) scheme has been developed to raise awareness of outbreaks in the different regions of the UK, so that horse owners can take precautions to minimise the chance that their horses might be exposed.

There should be no stigma attached to owning a horse that has had Strangles, or a premises that has managed an outbreak. Indeed, evidence suggests that containing the spread of disease, as well as treating and preventing carriers, can be reputation enhancing. Rather than remain silent, **SPEAK OUT**. Being open and communicating with others about an outbreak will help to reduce the spread of the disease and let everyone know that the outbreak is being resolved responsibly. The equestrian community should be supportive of such yards and be confident that Strangles can be eradicated from these premises and that these horses will not pose a risk to others in the future.

2. Know the clinical signs

The severity and number of clinical signs exhibited can vary between individual horses. Young, elderly and debilitated horses are often the most susceptible, but it is important to remember all horses are at risk. Clinical signs are not usually seen until 3-28 days after the horse has been infected.

Clinical signs include:

- Fever (rectal temperature over 38.5 °C)
- Depression and dullness
- Loss of appetite
- Swelling of the lymph nodes ('glands') under the jaw or on the head or neck, which indicate abscess formation and which usually point, rupture and discharge a yellow 'custard-like' pus
- Nasal discharge, which might be sudden and profuse after several days of illness
- Development of a cough, which is usually soft and non-hacking in nature

Horses can also have very mild clinical signs of Strangles, termed "atypical Strangles", with no obvious abscesses. This may be due to the horse having had Strangles before or variation in the particular strain or amount of *S. equi* that they have been exposed to. However, these horses still represent a serious infectious risk to those around them, so it is important that they are not missed.

Abscesses can rupture externally through the skin on the side of the head or under the jaw



CHECKING A HORSE'S TEMPERATURE TWICE DAILY HELPS IDENTIFY NEW CASES BEFORE THEY CAN PASS ON THE INFECTION



A contaminated bucket with drops of pus (highlighted by the arrows) that have the potential to infect several thousand horses

*Know what is normal for your horse.
A temperature over 38.5°C is a sign of infection*

3. Act fast

Call your vet, stop any horses moving on or off the yard and isolate the affected animal. Strangles can quickly spread through a group of horses and so it is important to act quickly to minimise the risk of an outbreak affecting other horses. Furthermore, the greater the amount of *S. equi* that a horse comes into contact with, the worse it will be affected.

Horses with early clinical signs of Strangles, such as fever (rectal temperature over 38.5 °C), can be isolated away from other animals so that the amount of *S. equi* that is able to spread to other horses is reduced. Regularly take the temperature of your horse, so that you know the 'normal' range and can quickly spot when your horse has fallen ill.

Strangles is not an airborne disease. However, Strangles can be spread easily by direct contact between horses or indirectly by handlers, equipment or contamination of the environment. This can lead to large outbreaks with many horses becoming infected if simple methods of isolation, cleaning and disinfection are not adopted and maintained.

For example, the infection can be spread through:

- Nose to nose contact between horses
- Facilities, horse boxes, tack, grooming and other equipment shared with infected horses
- Water troughs where the bacterium can survive for up to six weeks. Just one sip can be enough to infect another horse
- Feed buckets
- Hands and clothes of people moving between horses without taking adequate precautions

4. Implement the traffic light system

In the event of a suspected outbreak, use the 'traffic light' system to segregate horses into groups and minimise the risk to other horses on the yard and the surrounding area:

Red group

Isolate suspected or confirmed clinical cases in a group away from other horses on the yard. Mark equipment and tack with a **RED** label/tape to stop it being used on other horses. Use separate drinking water and feed buckets to other horses and prevent nose to nose contact. **Even two layers of electric fence 2 metres apart to separate horses in the same field, preventing nose to nose contact and the sharing of drinking water can be effective at preventing the spread of Strangles.**

Amber group

Isolate horses that may have had contact with suspected or confirmed cases in the past three weeks into an **AMBER** group. This could be all other horses on the yard, or only one or two animals. These horses could be incubating the disease and so it is important to check temperatures twice daily and move horses that develop temperatures over 38.5 °C or any other signs of Strangles into the **RED** group as soon as possible.

Green group

Isolate horses that have had no known contact with suspected or confirmed cases for at least three weeks into a **GREEN** group. These horses should be checked and attended to first every time to avoid transfer of *S. equi* to them from horses in the other two groups. Temperatures should be taken twice daily in case these horses have unknowingly been exposed to *S. equi*. Horses that develop fever (temperatures over 38.5°C) or any other signs of Strangles should be moved into the **RED** group as soon as possible. In some cases it may be more practical to change the group from green to amber or red, rather than moving individual horses, depending on group sizes, facilities and dynamics between horses.

Regular cleaning and disinfection of water troughs used by each of the groups should be performed to minimise the infectious dose of *S. equi* that other horses in those groups are exposed to, thereby reducing the severity of disease.

**IF YOU HAVE ANY CONCERNS
FOR YOUR HORSE'S HEALTH
CONTACT YOUR VET
IMMEDIATELY**



A separate paddock can be used as quarantine areas to prevent the spread of Strangles

5. Confirming Strangles

Strangles can be hard to confirm at the start of the infection as *S. equi* quickly migrates to the lymph nodes in the horse's head and neck and can often not be recovered from samples taken shortly after infection. A sample from a lymph node abscess provides the most reliable diagnosis of Strangles.

Strangles can also be diagnosed by taking samples from the guttural pouches of horses or the nasal discharge that drains from the guttural pouches following the rupture of abscesses located nearby. However, again these samples may be negative during the early phase of disease and repeated sampling may be required to confirm infection where this continues to be suspected.

Samples can be tested by veterinary diagnostic laboratories that will culture the bacteria or will use more sensitive modern 'qPCR' techniques that detect the DNA of *S. equi*.

6. Look for carriers at the end of the outbreak and before buying a new horse

Most horses will remain infectious as the pus from abscesses drains from their guttural pouches over a period of around 6 weeks, sometimes potentially longer, after clinical signs have resolved. However, approximately 10% of horses that recover from Strangles become persistently infected carriers of *S. equi* beyond this period even though they appear healthy.

Usually the pus from abscesses dries and forms balls called chondroids, which can be identified by your vet using an endoscope to look into the guttural pouches. Testing samples from the guttural pouch for the presence of *S. equi* DNA by qPCR is a sensitive way to identify which horses require further treatment. Removing chondroids, sometimes followed by additional treatment with antibiotics, cures a horse of being a carrier, eradicates the infection and eliminates the possibility of them causing future outbreaks. Note, all horses that were ill during an outbreak should be examined by guttural pouch endoscopy to determine if they have become persistently infected with *S. equi*.

Testing guttural pouch lavage samples by qPCR to identify the presence of *S. equi* DNA is the most sensitive method for the detection of persistently infected carriers. Screening horses that were not ill during an outbreak, or healthy new horses, by examining their guttural pouches to identify carriers can be time consuming and expensive. However, at the end of the outbreak over 90% of horses that were exposed to *S. equi* can be identified using the Strangles blood test, which measures the amount of antibodies to *S. equi* in the horse's bloodstream. Please note that the sooner the horse is tested after the outbreak, the more reliable the results are at identifying those healthy horses that

had been exposed to *S. equi* during the outbreak. As the test only requires a blood sample, it is easier, cheaper and more convenient for veterinarians to use. If the test is positive then these horses can be examined by endoscopy of the guttural pouch, reducing the number of horses that undergo this procedure.

The blood test can identify:

- Horses that are currently affected (from around two weeks after infection)
- Horses that were exposed to *S. equi* in the last six to ten months, that may have become carriers, sometimes even without having had obvious signs of Strangles. The sooner horses can be tested after an outbreak has ended, the more reliable the blood test results will be to identify horses that were exposed to *S. equi* during the outbreak. Please note that some horses return back to negative faster than others
- Horses that have developed abscesses in lymph nodes distant from the head and neck, so-called 'Bastard Strangles', a condition that is often fatal

An important limitation of the blood test is that it takes approximately two weeks for a horse to develop antibodies against *S. equi* and so it may not be possible to accurately identify horses in the early stages of the disease. Taking a second blood sample two weeks later can identify horses with rising antibody levels, indicating recent exposure to and potential infection with *S. equi*.



Using an endoscope to identify and treat persistently infected carriers

**IT IS ALWAYS BETTER TO BE SAFE THAN SORRY:
IF IT LOOKS LIKE STRANGLES,
TREAT IT LIKE STRANGLES**

7. Treatment

The circumstances of each case of Strangles should be individually assessed and discussed with the attending veterinary surgeon to decide the most appropriate treatment. Most affected horses recover over a period of a few weeks with good nursing care. However, treatment may be required if the infection becomes life-threatening.

8. Prevention

The mixing of horses from different areas, such as attending a show or new arrivals to a yard, increases the risk of disease being spread. Outwardly healthy horses are often overlooked as not being a risk but it is important to remember:

- A horse may be infected, but not yet show any clinical signs
- A horse may have atypical Strangles
- Carriers look healthy, but can intermittently shed the bacteria for months or years
- Horses not yet fully recovered from the disease can still shed the bacteria

Wherever possible quarantine horses entering a yard for a minimum of 3 weeks, take temperatures twice daily and monitor closely for signs of Strangles. Any horse that develops fever, a nasal discharge or other clinical sign consistent with Strangles should be isolated and tested for the presence of *S. equi*, preferably by qPCR.

The Strangles blood test can be used to screen horses before arrival and before release from quarantine, to identify those that have been exposed to Strangles, which may present a risk to resident horses. This enables Strangles to be detected and contained before it can spread to other horses on the yard.

Treatment is available for carriers to eliminate the persistent infection. Chondroids are removed from the guttural pouch and antibiotics may be required to kill residual bacteria. Horses are re-examined after two weeks to check if they are then free of infection.

Yard owners or managers are advised to use a yard agreement with their clients, which includes a management plan to be used in the event of an outbreak. Such a plan allows everyone on the yard to identify practical measures to stop the spread of Strangles so that everyone knows in advance what will happen and why. A yard agreement template is available on the Redwings website at: <https://www.redwings.org.uk/strangles/help-and-advice/yard-managers>.

Biosecurity plays a vital role in the prevention, control and spread of Strangles:

- Quarantine new arrivals to a yard so that they have no direct or indirect contact with other horses, or equipment used by other horses, for a minimum of three weeks
- Test horses using the Strangles blood test ideally before arrival or whilst in quarantine to identify horses exposed to *S. equi*.
- Do not allow your horse to share drinking water and avoid direct contact with other horses whilst attending equine events
- Regularly clean and disinfect all food and water containers, clothing, stabling and equipment at your yard
- Clean and disinfect horseboxes/trailers before and after collecting any new horses
- Wash hands between handling different horses



HORSES CLEARED OF *S. EQUI* INFECTION CAN CONTINUE TO LEAD HEALTHY LIVES AND NO LONGER POSE A THREAT TO OTHER HORSES

Chondroids that have been removed from the guttural pouch of a persistently infected carrier

Yards who want to take an active role in preventing strangles can apply to join the Premium Assured Strangles Scheme (PASS) which is a national control programme of testing and biosecurity following STEPS. Membership of PASS demonstrates a commitment to prevent accidental introduction of Strangles into a yard. This gives yard owners and horse owners peace of mind, it keeps horses healthy and minimises the risk of a Strangles outbreak see: www.equinehealthscheme.com

9. Vaccination

A live vaccine for Strangles, called Equilis StrepE, is available for administration via injection into the upper lip. However, its use can interfere with the diagnostic tests for Strangles. Contact your veterinary surgeon for further information.

Further information:

For further advice on Strangles and disease prevention visit
www.bhs.org.uk/diseaseprevention

To view the Horserace Betting Levy Board's code of practice for Strangles see:
<https://codes.hblb.org.uk/index.php/page/99>

To download a Strangles information pack or make a pledge to stay a step
ahead of strangles see:
<https://www.redwings.org.uk/strangles>

The Premium Assured Strangles Scheme (PASS) is open to equine yards
around the UK who want to take an active role in preventing Strangles see:
www.equinehealthscheme.com

To learn more about the Surveillance of Equine Strangles visit
www.jdata.co.za/ses

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Photos and image credit to Redwings Horse Sanctuary
Thanks to Dr Andrew Waller, formerly of The Animal Health Trust

