



What is Tetanus?

- Tetanus is a very serious neuromuscular disease caused by the toxins of the bacterium *Clostridium tetani*.
- *Clostridium tetani* is very commonly found in the environment, especially in soil or manure.
 - ▶ Like all other *Clostridium*, *C. tetani* is an anaerobic bacterium, meaning it can only grow (and produce toxin) when there is no oxygen present.
- **Tetanus is now rare in horses** in most countries because of widespread, **effective vaccination**, *not* because *C. tetani* has disappeared!



How Do Horses Get Tetanus?

Horses can develop tetanus if *C. tetani* gets into almost any body tissue and starts to produce tetanus toxin.



- The most common way for *C. tetani* to enter the tissues is through a wound, usually of the foot or lower leg, that gets contaminated with *C. tetani* spores from the soil.
- With severe or deep wounds, inflammation of the tissues can severely compromise the blood and oxygen supply to the affected tissue. If the oxygen level becomes too low, the *C. tetani* begins to grow and produce neurotoxins.

What Happens If A Horse Gets Tetanus?

- The neurotoxins affect nerves and interfere with the ability of the horse's muscles to relax. This results in severe, **uncontrollable muscle spasms** and increased muscle tone. Sometimes the muscle spasms are so severe that they can break bones. Classical signs of tetanus are related to severe muscle stiffness.
 - ▶ Often horses cannot open their mouths to eat or drink. Another name for this condition is "**lockjaw**".
 - ▶ An affected horse tends to assume a typical "**saw-horse**" **stance**, with all four legs rigid and straight, the head and neck extended and the tail elevated.
 - ▶ The horse's **third eyelids** (nictitans) may cover part of the eyes at the corner closest to the nose.
 - ▶ If the horse can walk at all, its gait will be very stiff.
- Affected horses are also very reactive to sound, light and touch. Stimulating the horse in any way can potentially cause convulsions. Horses with tetanus are **very dangerous** because they **do not have full control over their movements**.
- **Horses with tetanus usually die** from breathing problems, injuries caused by their muscle spasms and uncontrolled movements, inability to eat or drink, or other complications.



How Is Tetanus Diagnosed?

- Tetanus is usually diagnosed based on the horse's signs, since very few other diseases cause similar signs.
 - ▶ The toxin itself is very difficult to detect because it takes such a tiny amount to make the horse sick, and most of the toxin winds up in the nerves, not in the bloodstream.
- Sometimes *C. tetani* can be cultured from a contaminated or infected wound, but this is not often successful.



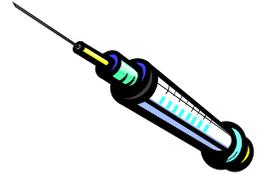
How Is Tetanus Treated?

- Treatment of tetanus in horses is very difficult, takes a long time, and is typically very expensive.
- If the horse can't eat or drink, it needs to be fed by a stomach tube or with intravenous (IV) solutions.
- A horse that cannot stand or is in danger of falling may need to be kept in a sling.
- It is best to keep an affected horse in a dark, quiet, padded stall.
- Sedatives are often used to try to decrease the animal's muscle spasms and convulsions.
- Antibiotics are usually given to try to kill the *C. tetani* at the site of infection.
- Tetanus antitoxin can be given to bind and neutralize the tetanus toxin.
 - ▶ Antitoxin only works on toxin that is in the blood, not the toxin that is already in the nerves.
 - ▶ Once tetanus toxin binds to a nerve, it cannot be removed. The antitoxin cannot reverse the nerve damage, but might help prevent it from getting worse. New nerve endings have to grow for the horse to get better. Because nerve endings grow so slowly, supportive treatment to keep the horse alive is needed for a long time.



How Can I Prevent My Horse From Getting Tetanus?

- Vaccination is very important. **All horses should be regularly vaccinated against tetanus.**
 - ▶ **Foals from vaccinated mares** should receive their first tetanus vaccine at six months of age, and another at seven months of age. **Foals from unvaccinated mares** should receive their first rabies vaccine at three to four months of age, followed by a booster four weeks later.
 - ▶ **All horses** should be vaccinated at 12 months of age, and then **once a year** after that.
 - ▶ Broodmares should be vaccinated once a year, ideally approximately 30 days before foaling.
- Try to reduce the risk of wounds, particularly on pasture, but this is often very difficult.
- Examine your horse regularly for wounds, and treat any wounds promptly. **Small, deep puncture wounds** may look less dramatic than large scrapes and cuts in the skin, but they **are more dangerous** - deep wounds are not open to the oxygen in the air, therefore *C. tetani* may be able to grow in them.
- If your horse sustains a deep penetrating/puncture wound, and it has been more than six months since its last tetanus vaccine, it is reasonable to re-vaccinate the horse when the wound is treated.

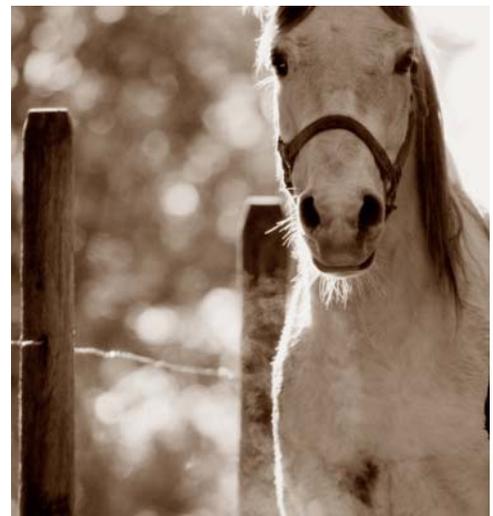


Why Does My Horse Get Vaccinated Against Tetanus More Often Than Me?

- People are usually only vaccinated for tetanus every 10 years, or if they have a deep wound.
- Horses are vaccinated more often for a several reasons:
 - ▶ Horses are one of the most susceptible animals in the world to tetanus. They are much more sensitive to tetanus toxin than people.
 - ▶ A wound on a horse is more likely to be contaminated with soil, and therefore more likely to be contaminated with *C. tetani*.
 - ▶ It is unknown exactly how long a horse will be protected from tetanus after vaccination. It is possible that horses are protected for more than a year, but there isn't enough evidence to know for certain how long horses can go between tetanus vaccines. Since tetanus vaccination is safe and relatively inexpensive, and because tetanus is such a devastating disease in horses, it is best to err on the side of caution and vaccinate horses frequently for tetanus.

My Horse Has A Wound On Its Leg. Should I Be Worried About Tetanus?

- If your horse has a wound, consult your veterinarian. He/she is your best resource in this kind of situation.
- In general, if your horse has been properly vaccinated, the risk of tetanus is very low.
- Prompt recognition and treatment of wounds, especially deep puncture wounds, is also an important part of tetanus control.
- Your veterinarian may recommend re-vaccinating your horse if it has been a while since your horse's last tetanus vaccine.



Do Horses Get Liver Disease From Tetanus Shots?

- A very serious (usually fatal) liver disease called Theiler's Disease (also known as serum hepatitis) has been associated with treatment with **tetanus antitoxin**, **NOT** tetanus vaccine.
- Tetanus antitoxin is rarely needed. It is only used in situations where there is a high risk of tetanus in an unvaccinated horse, or for treatment of tetanus.