

Avoiding the Hiss-terics: Snake Bites and Horses

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So you think your horse has been bitten by a snake, or worse, you *watched* your four legged friend get bit by a snake. What do you do? Who do you call? What is the prognosis?

Snakes in the United States

The United States is home to many different snake species. Fortunately, in the United States there are only four families of snakes that have a venomous bite. These four venomous snake families are rattlesnakes, copperheads, water moccasins (also known as cottonmouths), and coral snakes. Coral snakes typically do not pose a risk to horses due to their small jaw size.

About 90% of all snake bites occur between April and October in the United States. The most common offender is the rattlesnake, primarily due to their large habitat range and less elusive nature.

Horses are typically bitten on the legs, though not always. Horses are also frequently bitten on the face due to their curious nature and poor vision that requires them to often place their head close to objects they’re investigating.



Snake bites in horses, even if they’re from nonvenomous species, can cause a slew of problems. A bite with little or no venom injected, or “dry bite,” risks tetanus and other secondary infections and may warrant veterinary attention. Venomous bites will warrant veterinarian treatment, but are even more severe when the bite is on the head or face, or when the snake releases all of it’s venom (ex: if it were dying during the bite).

Snake venom varies among species. Most contain chemicals that break down tissues, including blood vessels, which can impair blood clotting. Neurotoxic venom, such as that produced by coral snakes and the Mojave rattlesnake (pictured above), can cause severe neurological symptoms. Snake venom can also negatively affect the major organs, such as the heart and kidney as well as major processes such as erythropoiesis.

Post-Bite: What to Do (and what *not* to do!)

To start off, it’s important to know what *not* to do when dealing with a snake bite (and the snake). Although it seems like a good idea to some, **do not** try to capture the offender. This can put you at risk of being bit as well.

You may try to capture a photo of the snake, but **if you suspect the snake is venomous**, refrain from doing this, call your veterinarian, and spend your time attending to your horse instead. **It is not advised** to try to remove the venom (either with your mouth or with suction tools). Also, applying a tourniquet to a bitten limb **is not recommended**. Applying a tourniquet will likely cause other issues with the limb while also failing to halt venom spread throughout the body. Hot and cold packs likely will not make a difference in the case of a snake bite and are not recommended. Hot packs are known to increase blood flow, thus increasing venom spread throughout the body. Finally, the biggest mistake made by owners is a delay in presentation for treatment. If there is any rapid swelling found on your horse or you suspect a venomous snake bite, contact your veterinarian immediately.

Now that we've covered what isn't recommended, here are some things you can do after witnessing a snake bite:

- Assess your horse... is he at risk? Where is the bite? How big is my horse? How healthy is he? Is he currently taking any medications that may heighten his chances of medical emergencies in the case of a snake bite? Are we in a location that is close to or far from help?
 - For example: in the case of a face bite, the immediate and largest concern should be asphyxiation.
- If you suspect the snake was venomous or are unsure if the snake was venomous, **immediately** call your veterinarian. If you notice any sudden and abnormal swelling yet didn't witness a snake bite, **immediately call your veterinarian.**
- **If the horse was bitten on the face**, your veterinarian will likely instruct you to first assemble tools to keep the horse's airway open in the event of extreme swelling. Wet tubing, a cut off syringe tube, or a hose will work and should be cut 6-8 inches in length (pictured above). The tool should be lubricated and inserted approximately four inches into the nostrils. It should be inserted far enough that it remains in the nostrils by itself. It is advised to secure these tubes with tape as a precaution.
 - This is a good tool to keep prepared and in your saddle bag if you frequent trails where there are venomous snakes.
 - There are commercially made equine airway tools that can be purchased from various companies.
- **The best first aid is to keep the horse calm and call your vet.** Excitement and unnecessary work is not advised. Increasing a horse's blood pressure will only expedite the travel of any venom throughout the body. If you're away from the stables, bringing a trailer to your horse is incredibly helpful to prevent them from moving too much.



If you suspect your horse has been bitten by a snake, the following symptoms can be possible signs of a snake bite. Looking for a snake bite wound may be difficult if it is not an obvious wound.

Pain	Localized swelling	Puncture wounds	Hemorrhage
Coagulopathy	Sloughing of tissues near bite site	Cardiac arrhythmias	Shock
Collapse		Respiratory distress (in the case of a face bite)	
Signs of envenomation can take hours to appear depending on many factors.			

Tissue destruction from a snake bite wound can develop hours to weeks later. This puts an individual at risk because sloughing tissue typically leaves vulnerable wounds that are relatively large in size. These wounds can become gangrenous, so it is important to monitor for any signs of tissue sloughing both during the treatment process and the healing process.

Neurotoxic venom does have its own special set of neurologic signs. These include: muscle fasciculations or twitching, tetraparesis (weakened limbs), ptyalism (overproduction of saliva), shallow or abnormal breathing (example: tachypnea), ataxia, decreased spinal reflexes, and quiet mentation.

Getting Your Veterinarian Involved

Veterinary treatment focuses on four main steps: preventing asphyxiation, controlling inflammation and shock, preventing infection and disease, and countering the venom.

1. Prevent Asphyxiation

- Typically a concern in the case of bites to the face.
- Tubing up the nostrils is sometimes required. In severe cases, a tracheostomy may be performed (pictured right).
- Sometimes, nutritional support by means of a stomach tube is required in patients with nasal swelling who may experience difficulty eating or drinking.



2. Control Inflammation and Shock

- Fluid therapy, pain medications, ventilatory support, and anticonvulsants are all used when managing a horse in shock or with severe inflammation.

3. Preventing Infection and Disease

- a. Cleaning and treating the wound (with antibiotics) is done in nearly every case of a snake bite.
 - i. *Pseudomonas aeruginosa*, *Clostridium* spp., *Corynebacterium* spp, and staphylococci are found in the mouth of many species of rattlesnakes.
- b. Tetanus toxoid may be given if there is risk of a tetanus infection.

4. Countering the Venom

- Antivenom is dosed to counteract tissue damage and control pain. It is dosed based on the type of venom and amount of venom suspected to have been injected.
- It may aid in preventing or controlling coagulopathy.
- It is best if antivenom is given in the first 6 hours post-bite, though it can be effective up to 24 hours after a snake bite.
- Epinephrine can be given subcutaneously if a reaction to the antivenom occurs.

The Prognosis

The prognosis of a snake bite depends entirely on the individual and the nature of the bite and treatment. Some subsequent complications that have been noted in the field include: chronic heart failure, kidney damage, hemolytic anemia, and other cardiac issues months later. Because of this, owners should watch for any breathing abnormalities or general weakness in their horses after a snake bite. Most individuals who receive rapid veterinary treatment recover fully.

Prevention and Vaccinations

If you live in or are traveling to a location within the United States where you may be at risk of encountering a venomous snake, there is a vaccine available. This vaccine (crotalus atrox toxoid) is a pre-exposure vaccine. The American Association of Equine Practitioners states that this vaccine is only appropriate for individuals who are six months in age or older and that are in good health.

The recommended vaccination schedule is as follows:

Recommended Vaccination Schedule		
Healthy Adult Horses	Pregnant Mares	Foals over 6 months
Primary Doses: 3 given at one month intervals Booster Doses: every 6 months	<i>Contact manufacturer</i>	Primary Doses: 3 given at one month intervals Booster Doses: every 6 months

This vaccine specifically protects against the following venoms:

- Western Diamondback rattlesnakes bites (including Prairie, Great basin, Northern and Southern pacific varieties)
- Sidewinder
- Timber rattlesnake
- Massasauga
- Copperhead

This vaccine may also give partial protection against venom from the water moccasin (cottonmouth), coral snakes, and the Mojave rattlesnake.

Snake and horses aren't the most ideal combination to deal with, but with quick thinking and the helping hand of a knowledgeable veterinarian, you and your four legged pal should be back on the trails in no time.



Katherine "Kit" DeWolf is one of three recipients of the 2020 Ride & Tie scholarship award, presented annually to a deserving veterinary student(s). Kit completed her Bachelor of Science in Equine Studies: Equine Science at the University of New Hampshire in May of 2022 and began working towards becoming a veterinarian in August of the same year at the University of Pennsylvania School of Veterinary Medicine.

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