

Snake, Rattle, and Slither...

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SNAAAKKKE!! This is the time of year for rattle snakes and we seem to be dealing with more snake bites in both dogs and cats. It's important to know a little about the slithery creatures, how to avoid them, what to do if you find them, and what to do if you pet is bitten.

The San Fernando Valley is home to the Southern Pacific Rattle Snake (*Crotalus oreganus helleri*). These snakes are part of a group called Pit Vipers and can be distinguished by their triangular head. What makes this group unique is that they all share a common characteristic: a deep pit, or fossa, between the eye and the nostril on either side of the head. These pits are the external openings to a pair of extremely sensitive infrared detecting organs, which in effect give the snakes a sixth sense that helps them to find and perhaps even judge the size of the small warm-blooded prey including us and our pets.

Every year the Centers for Disease Control and Prevention logs 7,000 reports of snakebites in the U.S., which lead to about 15 deaths. Most rattlesnakes warn off potential predators by shaking their noisy tails. In contrast, Southern Pacific rattlesnakes are more apt to lay low or move away than hiss and rattle when confronted, a strategy that may boost their chances of surviving, but makes it even more dangerous for us.

There has been a rise in the incidence of super-toxic bite cases reflecting a change in the species' venom. To predigest their prey, most rattlers produce so-called cellular toxins and blood toxins, which damage tissue and disrupt blood clotting. Toxins from snakes have evolved so that the effects are multiplied when the victim runs. The increased muscle activity and heart rate of the victim make for a quicker kill. That is why it is so important to remain calm and immobile after a bite. The Southern Pacific rattler also produces a neurotoxin, which is more serious because it quickly affects breathing and muscle control. There are reports that suggest that the snake's venom contains more neurotoxin than it did a few years ago.

Rattlesnake fangs are connected by venom ducts to large poison glands near the outer edge of the upper jaw, towards the rear of the head. When the rattlesnake bites, muscles on the sides of the venom glands contract, which squeezes the venom through the ducts and into the fangs. When the fangs are not in use, they remain folded against the palate. Rattlesnakes are born with fully functioning fangs and venom, and are capable of killing prey at birth. Baby rattlesnakes cannot control the amount of venom injected so they usually fully envenomate during a bite. Be especially careful around the baby snakes. Adult rattlesnakes have more control over venom. Adults also shed their fangs every 6–10 weeks. At least 3 pairs of replacement fangs lie behind the functional pair.

Avoiding snakes is the real key. Rattlesnakes tend to avoid wide open spaces where they cannot hide from predators, and will generally avoid humans if they are aware of their approach. Rattlesnakes rarely

bite unless they feel threatened or provoked. It's important to be particularly careful when around fallen logs or boulders and near rocky outcroppings and ledges where rattlesnakes may be hiding or sunning themselves. They can also just be out in the open or in the grass on the hiking trail. Caution is advised even when snakes are believed to be dead; rattlesnake heads can see, flick the tongue, and inflict venomous bites for up to an hour after being severed from the body. Rattlesnake avoidance classes are available for dogs and use a variety of methods. Our clients have successfully used these services. If you find a snake there can be no amount of curiosity strong enough to do anything but walk away. Snakes can strike $\frac{1}{2}$ to $\frac{3}{4}$ of their total length so don't chance it.

Dogs are usually bitten on the feet and muzzle. In our experience, cats are bitten mostly on the feet. Snakes, except for babies, can control the amount of venom injected. Some bites, containing very little venom, are called "dry bites". The primary sign of a snake bite is extreme swelling and pain. The pain will not only be severe over the bite but will radiate up the leg and down the neck so touching away from the swelling can be painful too. Swelling is rapid and bruising is common. The fang punctures can usually be located at the point of the swelling.

If your dog or cat is bitten, remain calm. Carry them, if possible, to the car for immediate transport to an emergency, urgent care, or other veterinary practice facility with expertise treating snake bites. Time is of the essence. We find here that the antivenin works best if given within in the first two hours after a bite. While it will still work later, it is less effective. Antivenin is the key part of treatment for us here. We like to immediately give two vials to all pets bitten because they seem to have the best outcome. Typical costs for two vials of Crotalus Antivenom are \$1,200 to 1,400. We also use intravenous continuous drip narcotic pain control, fluids to help eliminate toxins, and antibiotics to combat infection. Our success rate to date is excellent.

There is a vaccine against rattlesnake venom made by Red Rock Biologics called Crotalus Atox Toxoid. We have used it here with excellent results. The vaccine is for dogs only and consists on a weight dependent beginning protocol, of 2-3 vaccines with boosters every 6-12 months. We usually booster dogs once a year in April so that the protection will last through October. The company states that the vaccine can be equivalent to two vials of antivenin in effect. We have seen vaccinated dogs bitten and they do seem to be less painful with less swelling, almost like a "dry bite". We still treat these dogs aggressively with antivenin, fluids, pain control, and antibiotics.

The best way to deal with snakes is to consider snake proofing the yard. Then teach avoidance to everyone in the family. Then run like hell yelling SNAAAKKKE!!

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