



# TOXTALKS

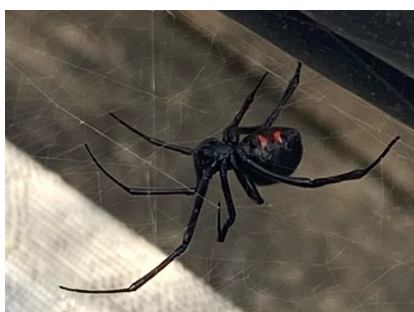
A BULLETIN FOR HEALTHCARE PROFESSIONALS WHO MANAGE POISONED PATIENTS

Blue Ridge Poison Center

| University of Virginia Health

| April 2023

## Black Widow Spider Envenomations



Black widow spiders are native to North America, with several *Lactrodectus* species found in different regions of the country. In Virginia, *Latrodectus mactans* (southern black widow) is the most common. Female black widows have fangs long enough to penetrate human skin, while the males do not. Females are usually large (8-10 mm), black in color, and usually have a distinctive red hourglass pattern on ventral surface of the abdomen. This marking can vary in color (red to orange) and in shape (hourglass, stripe, or spot).

### Where are black widows encountered?

Black widows tend to be found in secluded areas, such as woodpiles, sheds, outhouses, garages, basements, barns, and shoes. They live in large, tangled, irregularly shaped webs close to the ground to trap small insect prey. Bites to humans are usually provoked by touching the web or the spider and are defensive in nature. Bites tend to occur during times when people are most likely to come in contact with spiders: during the warmer summer months or in the fall when the weather turns cool and spiders migrate indoors.

### What is black widow venom?

The primary toxin in black widow venom is called alpha-latrotoxin. It binds to pre-synaptic neurons and increases influx of calcium into the cell. This influx of calcium causes massive release of vesicles containing neurotransmitters, such as acetylcholine and catecholamines, leading to symptoms of envenomation.

What are the symptoms of envenomation?

The bite of a black widow may feel like a pinprick or may initially go unnoticed. Pain typically develops 10-60 minutes around the area of the bite and erythema may be noted at the site. Localized diaphoresis may be seen at the site of the bite and a target lesion may develop. Over time, the pain progresses centrally from the bite site and causes severe muscle pain and fasciculations. Severe chest pain may develop and mimic other forms of acute chest pain. Abdominal rigidity may be seen and mimic a surgical abdomen. Nausea, vomiting, diaphoresis, hypertension, and tachycardia are also common. This constellation of systemic symptoms is known as latrodectism. The symptoms are a result of the massive neurotransmitter release, leading to muscle contractions from acetylcholine release and adrenergic

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symptoms from release of catecholamines. Intense pain often lasts for 2 days, followed by gradual decline and a washout period demonstrated by fatigue and weakness. This is thought to be due to the depletion of neurotransmitters that occurs during the acute phase of envenomation.

### What is the treatment?

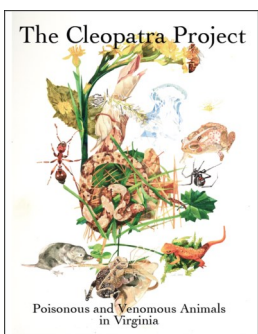
Treatment is aimed at relieving pain from muscle spasms and controlling hypertension. Benzodiazepines and opioids are the mainstay of treatment. Tetanus should be updated as needed. In the past it was believed that calcium gluconate, methocarbamol, and dantrolene were beneficial; however. Subsequent studies have failed to show efficacy of these treatments and they are no longer recommended.

### Is there an antivenom?

A F(ab)2 fragment is currently in development and has shown promise in clinical trials, but is not yet approved for use in the US by the FDA.

Black widow spider envenomation is not often seen by medical professionals. While mortality is rare, the pain experienced by patients can be agonizing. As we enter summer, black widow envenomation should be considered in cases of atypical chest pain, abdominal pain, or an inconsolable child.

In the event of a black widow bite, please contact the University of Virginia Health's Blue Ridge Poison Center at 1-800-222-1222. Our center is collecting data associated with black widow envenomation and can help with management questions.



For further reading on venomous and poisonous animals in Virginia, please see the [The Cleopatra Project: Poisonous and Venomous Animals in Virginia](#) which is a joint effort between the Virginia Master Naturalist Program, the Blue Ridge Poison Center at University of Virginia Health, and the University of Virginia School of Medicine's Division of Medical Toxicology – Department of Emergency Medicine.

