



THE SCARY TALE OF SNAKES... AND THEIR BITES

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DIVESH

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RUKA

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OPHIDIOPHOBIA

Fear of snakes.

VENOM

The poison injected by snakes during a bite.

If you have a fear of snakes, you are not alone! There are over 3,000 species of snakes in the world and many of them are poisonous. The most common poisonous snake in the United States is called the pit viper. Poisonous snakes use their venom to capture prey or to bite their enemies in self-defense. If a snake bites you, it is important that you go to the hospital to get treated. Some doctors specialize in recognizing and treating snakebites, and there is an antidote that can be given for bites from the most dangerous snakes. In this article, we review why some snakebites are worse than others and what to do if you are bitten.

ARE YOU AFRAID OF SNAKES?

The fear of snakes is called **ophidiophobia**, and it is very common—partly because thousands of people are bitten by snakes every year [1]! Some snakes have a poison called **venom** that gets injected during a bite. When a person gets poisoned after being bitten by a snake, this is called

ENVENOMATION

The act of being poisoned by venom from a snakebite.

envenomation. While snakebites can be dangerous, with the right care and treatment they are unlikely to cause any major injury.

WHY DO SNAKES BITE?

Snakes do not want to hurt people, and they certainly do not want to eat people. The typical snake diet consists of small rodents and insects, although bigger snakes can eat larger animals, including other snakes. Poisonous snakes use their venom to capture prey or to bite their enemies in self-defense. Enemies of the snake include large birds, badgers, bobcats, and bigger snakes! When a snake bites a person, it is most likely because the snake was frightened and felt it had to defend itself. This can happen if a person steps on a snake that they did not see or unknowingly reaches into a crevice or hole where a snake is living. Alarmed, the snake attacks! Often, the snake's two fangs leave two puncture marks as evidence of the bite.

ARE ALL SNAKEBITES DANGEROUS TO PEOPLE?

There are over 3,000 different species of snakes, and around 20% are venomous, meaning they can make poison. Venomous snakes store their poison in glands close to their fangs, and they can release the venom through their fangs when biting their prey (Figure 1). In the United States, the majority of venomous snakes are pit vipers. Pit vipers get their name from the pits located below their eyes (Figure 2). The pits are heat-sensing, so these snakes can detect the heat from nearby living creatures. Pit vipers use this ability to "see" their prey in the dark. This means that, if you are out walking at night, you might not be able to see a snake—but the snake can sense you.

Non-venomous snakes in the United States include garter snakes and rat snakes. Venomous snakes found in the United States include the copperhead, cottonmouth, coral snake, and rattlesnake (Figure 3). The most common snakebites in the United States are from rattlesnakes. Different types of snakes contain different types of venom, and each venom has unique effects on the human body. One type of venom can be damaging to muscles and skin, causing swelling and bruising at the site of the bite. A different type of venom can affect the blood, temporarily making people bleed more easily from cuts or scrapes. The most dangerous type of venom can damage the nerves, paralyzing people and making it difficult to breathe. Thankfully, bites from snakes with this scary venom are very rare in the United States.

After being bitten by a snake, a person might start to have symptoms within a few minutes. The snakebite might be painful or feel like it is burning, and the area around the bite might swell significantly. This swelling can get worse quickly—for example, if a snake bites someone's finger, the swelling might spread up to their elbow! The

Figure 1

The physical differences between pit vipers and non-venomous snakes. Pit vipers have triangular heads, fangs, heat-sensing pits, and pupils that are elliptical in shape. Non-venomous snakes have rounded heads, round pupils, and do not have pits or fangs. Image credit: <https://www.merckmanuals.com/professional/multimedia/figure/identifying-pit-vipers>; used with permission.

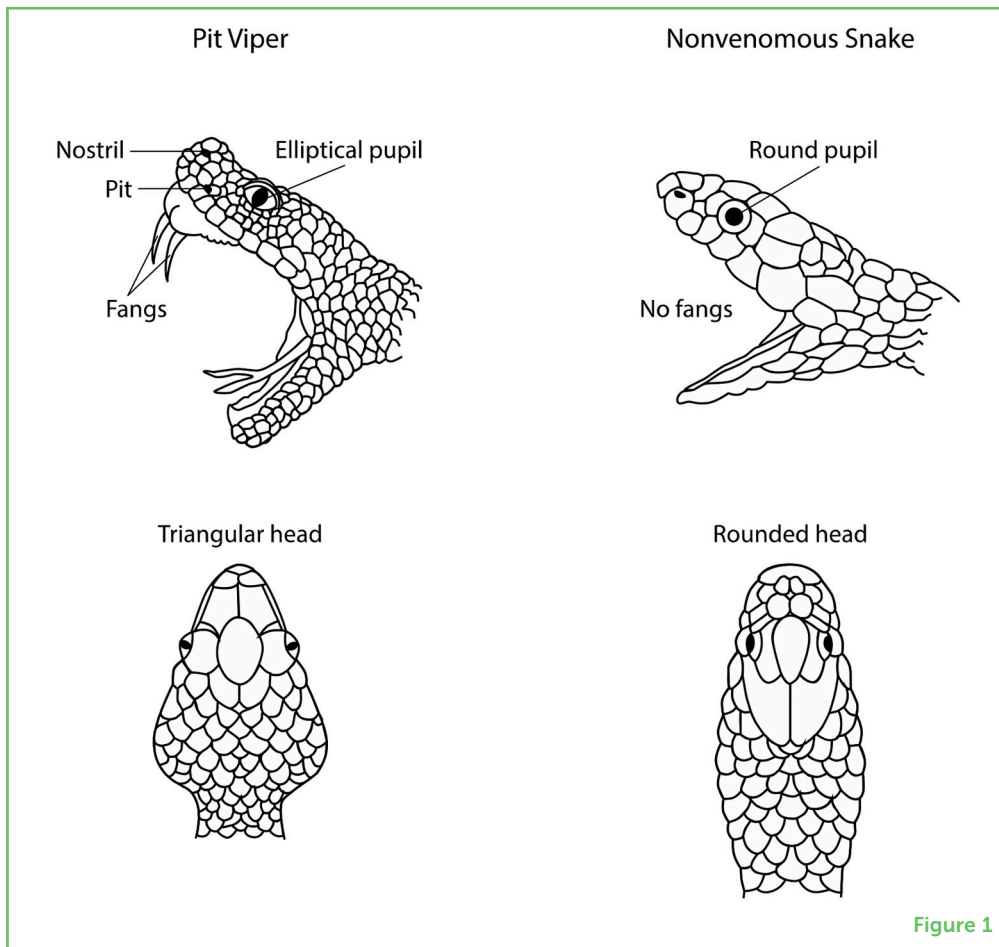


Figure 1

Figure 2

Image of Pit Viper. This image shows some characteristics of venomous snakes including the triangular head, heat-sensing pit, and elliptical pupils. Photo credit: ©Anurag Nashirabadkar, @commons.wikimedia.org, Pit Viper, <https://creativecommons.org/licenses/by/4.0/>.

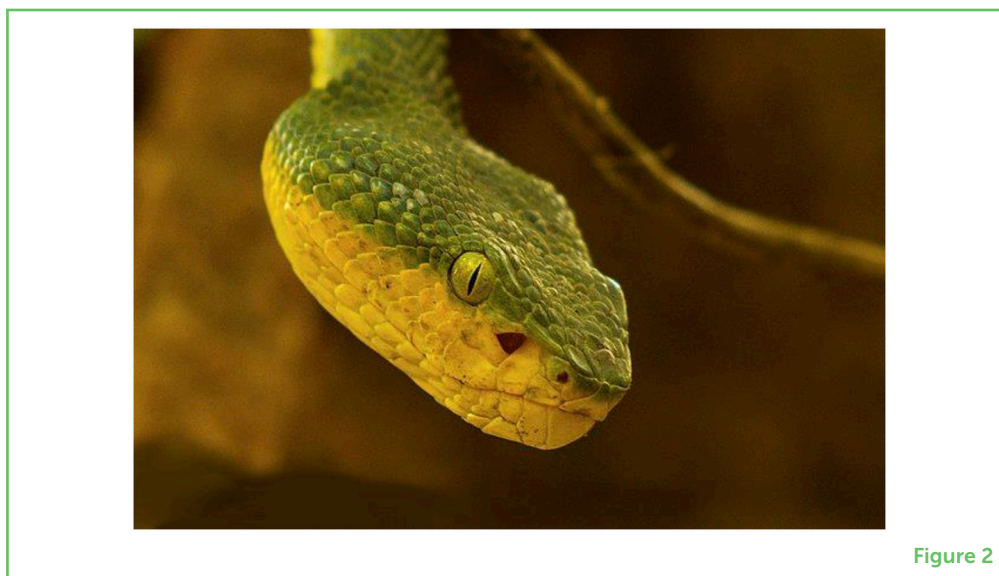


Figure 2

DRY BITE

A snakebite in which the person does not receive any poison from the snake.

color of the skin can also change to a red or deep purple, similar to a bruise. However, even if a snake has venom, it might not poison you with its bite. Around one out of every five snakebites is called a **dry bite**, in which the person does not receive any poison from the snake [2].

Figure 3

Snakes found in the United States may be venomous (such as the copperhead, cottonmouth, coral snake, and rattlesnake) or non-venomous (such as garter snakes and rat snakes). (A) Copperhead (©Peter Paplanus); (B) Cottonmouth (©Peter Paplanus); (C) Coral snake (©John); (D) Rattlesnake (©Tony Alter); (E) Garter snake (©Greg Schechter); (F) Rat snake (©Judy Gallagher). Photo credits:

@commons.wikimedia.org, (A) Eastern copperhead (*Agkistrodon contortrix*), (B) Western cottonmouth (*Agkistrodon piscivorus leucostoma*), (C) Eastern coral snake, (D) Timber rattlesnake, (E) Common garter snake (*Thamnophis sirtalis*), (F) Black rat snake; <https://creativecommons.org/licenses/by/2.0/>.

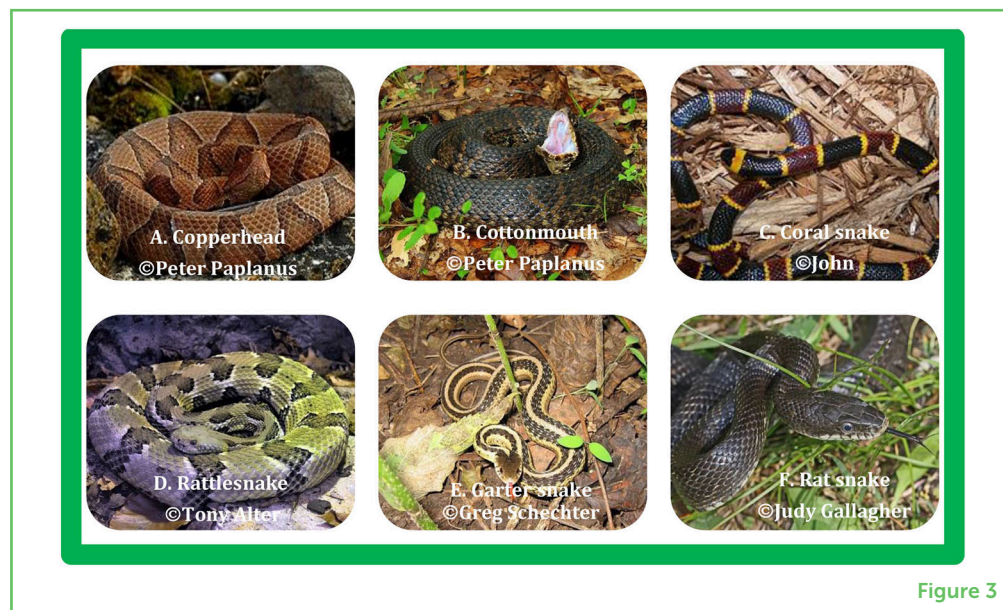


Figure 3

WHAT SHOULD I DO IMMEDIATELY AFTER A SNAKEBITE?

If you are bitten by a snake, first of all, stay calm. You are going to be okay! What is most important is to get away from the snake—but likely it will “run” away from you first. There is no need to try to see what the snake looks like or to capture the snake. Get yourself to safety (Table 1)! Second, yell for an adult, tell a friend to get help, or use a phone to call your parent or caregiver. If no one is close by, call 911 and they will send help.

Do	Do not
Get yourself to safety	Do not suck the venom out of the bite
Get help or call 911	Do not use a tourniquet
Stay in a comfortable position	Do not use ice
Get to the hospital	

Table 1

Table 1

First Aid Treatment of Venomous Snake Bites [3].

TOURNIQUET

A device used to apply pressure and stop blood flow.

If you have seen a person get a snakebite on television or in a movie, you have likely seen people do the wrong things (Table 1)! *Do not* try to suck the venom out of the bite. This does not actually help to remove the venom from the body, and it is more likely to infect the wound with bacteria that live in the mouth. *Do not* use a **tourniquet**, which is a device used to apply pressure. In the past, tourniquets were used to stop the venom from getting to the heart and the rest of the body; but using a tourniquet keeps the venom in place and is likely to cause more injury to the area around the snakebite. *Do* try to stay in a comfortable position, but *do not* use ice! Ice might temporarily relieve some of the pain, but the body is working to get rid of the venom as quickly as it can, and ice will slow this process, making the pain worse in the long

run. Most importantly, the smartest thing to do after a snakebite is to get to the hospital as quickly as possible.

HOW DO DOCTORS TREAT SNAKEBITES?

If a person goes to the emergency room after being bitten by a snake, doctors will start by asking questions about what happened. They need to know where the snakebite is, what time the bite happened, and if there are any symptoms. The doctors will use a marker on the skin to show where the snakebite is located and how swollen it is. Doctors will also run blood tests to see how the venom is affecting the bite victim. Doctors or nurses will check in frequently, and if the victim has any pain, medicine will be given.

There is an **antidote** to snake venom that can be given if needed. An antidote is a medicine that treats a poison. The antidote for snakebites is made from the venom of snakes similar to the one that the person was bitten by, so that the antidote can recognize the venom in the person's body and attack it. Receiving the antidote can help a person recover from a snakebite quicker than they would on their own. This medicine can be given through a needle inserted into a vein in the arm. To decide if a person needs an antidote, a **toxicologist**, who is a doctor that specializes in treating poisons, might visit the patient. Snakebite victims generally spend a few hours in the emergency room while the doctors check on them, and sometimes they must stay in the hospital overnight. Once the person is feeling better, they can go home—and within a couple of weeks they are usually healed.

HOW CAN I AVOID SNAKEBITES?

To decrease your chances of being bitten by a snake, watch where you are going—particularly in areas where snakes are likely to be, such as woods and tall grass. When walking in the dark, pay careful attention to your surroundings. If possible, use a flashlight so that you can see clearly, and never walk barefoot outside. Even if a snake tries to bite you, it will not be able to poison you through your shoes! Use extra caution in places where snakes might be. If you cannot see inside a hole or small space, do not stick your hand into it!

CONCLUSION

It is unlikely that you will ever be bitten by a snake, and even more unlikely that you will be poisoned. If a poisonous snake *does* bite you, knowing what to do can help you stay healthy and calm. *Do not* apply ice, attempt to suck the venom out, or use a tourniquet. *Do* call for help and go to a hospital as quickly as you can. With a doctor's help, you will receive the medications and treatment you need and be on

ANTIDOTE

A medicine that treats a poison.

TOXICOLOGIST

A doctor that specializes in treating poisons.

your way to a full recovery! Finally, for more fun facts about snakes, check out [this site](#) or [this one](#). Even if you have ophidiophobia, snakes can be fascinating creatures to learn about!

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YOUNG REVIEWERS

DIVESH, AGE: 11

Hi! My name is Divesh. I love to learn about cars and new technologies. I enjoy reading horror books and go for cycling during my leisure time. I enjoyed participating as a young reviewer for this manuscript.



**RUKA, AGE: 11**

I am a funny girl who wants to make everyone happy. I like to play with my friends and listen to music. I am good at singing, dancing, and playing the piano.

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