



# VENOM EXTRACTOR KITS: More Harm, No Good

Kits sold to remove venom from a snakebite do not work,  
may be harmful and should not be used.

*A public service message from BTG Specialty Pharmaceuticals, a company focused on critical care medicines*

For at least 60 years we've had evidence that venom extractors don't work and may in some cases do greater harm to a snakebite victim, yet they remain commercially available, and snakebite victims continue to use them.

BTG examined nearly three dozen clinical research studies, editorials, guidelines and literature reviews on venom extractors and interviewed 15 practitioners who are experts in the treatment of snakebites. These are the facts:

- **There is no arguing with the science:** Venom extractors do not help a snakebite victim and in some cases have caused greater damage to the victim.
- **Claims of their effectiveness are misinformation:** Carrying a venom extractor kit in snake country provides a false sense of security. If bitten by a snake, a venom extractor is no more helpful than a lucky charm.
- **Time is tissue:** The best response to a snakebite is to get to a hospital as quickly and as safely as possible. Anything that delays accessing qualified medical care risks unnecessary injury.

All 15 experts agree: Venom extractors should not be used for snakebites. And retailers should critically examine the claims these products make about snakebites, as they are not supported by any of the available medical evidence.

## TIME IS TISSUE!

Most snakes encountered naturally in the United States are pit vipers. These include rattlesnakes, copperheads, cottonmouths and several other species of snake with a pit – a heat-sensitive organ between the eye and nostril – that helps them strike at prey.

Pit vipers, or any other type of snake for that matter, don't go looking to bite humans. But when they are deliberately disturbed, get stepped on or are otherwise surprised, they may strike. When that happens, *don't panic*. Do proceed immediately to the hospital. Delays in treatment can lead to tissue damage.

This spring and summer, legions of hikers, campers, gardeners and other outdoor enthusiasts will head outside, safety and utility gear at the ready. Many of them will unknowingly have purchased a device that will at best prove useless in a snakebite emergency and at worst cause unnecessary tissue damage or permanent disability.

Snake venom extractor kits, marketed and sold as field treatments, have been proven to have no beneficial effect on snakebites, according to a wide range of physicians, toxicologists and other experts. One study showed the devices could cause serious damage to the area around the wound without extracting venom or protecting the victim's muscle tissue in any way.

The experts almost unanimously agree that extractor kits could deprive snakebite victims of precious time between the bite and appropriate treatment in a hospital emergency department. If applying a venom extractor removes a bite victim's sense of urgency, delays a trip to the hospital by even a few minutes or fools them into thinking they don't need to seek medical help at all, the result could be permanent tissue damage or disability.

And yet despite the widespread agreement on their inefficacy for snakebites, venom extractors continue to be found among consumers' first-aid kits. Absent any action from government – the Food and Drug Administration **classifies** venom extractors as medical devices but has not issued rules on their sale or marketing – and because snakebites are almost always treatable, the products remain commercially available.

Perhaps retailers continue to stock venom extractors under the mistaken belief that they can, as their product packaging claims, treat venomous snakebites – and perhaps retailers would discontinue the offerings if they better understood the harm they might cause and the risks they create for consumers.

To better understand these risks, BTG Specialty Pharmaceuticals surveyed the medical literature and conducted interviews with 15 practitioners who are experts in the treatment of snakebites. In our research we sought an understanding of the available scientific evidence on venom extractor efficacy, a well-rounded view of expert perspectives on the persistence of these products and an informed perspective on the best way to ensure that outdoor enthusiasts will embark on their adventures armed with accurate information about what to do if bitten by a snake.

## Do's & Don'ts for Snakebites

Here are the key steps to take – and to avoid:

### DO:

- **Go immediately** to your car or to wherever you can get a ride to the hospital.
- **Call 911 if you can't reach a hospital on your own.** Ask for an ambulance.
- **Remove constrictions.** Jewelry, watches and tight-fitting clothes, in anticipation of swelling.
- **Take photos** of the wound with your phone every 15 minutes until you get to the ER. It will help your doctor understand the venom's progression.
- **Elevate the wound.** Keep it above your heart to limit blood flow around the bite and slow the venom's spread.
- **Be still.** Limiting your movement will also limit the rate at which venom spreads.

*“There is nothing to do outside of calling 911 and getting to an ER. Car keys and a cell phone are all that you need.”*

– Dr. Nick Brandehoff

### DO NOT:

- Delay your trip to the hospital.
- Use a venom extractor.
- Apply a tourniquet.
- Attempt to cut or apply suction to the bite.
- Apply cold packs or ice.
- Use Advil, Motrin, Benadryl or any other drugs.
- Use shock treatments or apply electricity to the bite.
- Attempt to capture, kill or transport the snake, or approach the snake in any way.

As a result of this examination, BTG Specialty Pharmaceuticals calls on retailers selling venom extractors to critically examine the claims these products make, as they are not supported by the available medical evidence. In fact, snakebite victims who use commercially available venom extractors are at risk of suffering unnecessary injury, including potential long-term disability.

## KEY FINDINGS

### Extractors should never be used on snakebites

For the North American hiker planning her trip into the wilderness or the backyard gardener concerned about snakes sleeping beneath his shrubs – or even the average homeowner who may encounter a snake while watering the lawn or moving garbage cans – the lure of venom extractors is easy to understand. Widely available at outdoor-centric retailers and online – Amazon.com offers dozens of options in the category – venom extractors are often promoted with claims that they are endorsed by doctors.

*“Because the extractors could cause an injury pattern, they should be off the shelves.”*

And yet, according to the experts we interviewed, there is little evidence, scientific or anecdotal, to demonstrate that snake venom extractors deliver on their basic promise to remove venom from wounds caused by snakebites. In one study, extractors not only proved ineffective at removing venom but also caused injury to the tissue surrounding the bite.

“There is no argument against the science,” says the author of **that study**, Dr. Sean Bush, a Wilderness Medicine Fellow at the Yale School of Medicine and a veteran emergency physician. “Because the extractors could cause an injury pattern, it goes against the physician’s oath to do no harm. It does no good and may do harm.”

The impact of Dr. Bush’s study is apparent in the medical profession. Physicians and paramedics, according to the experts with whom we spoke, broadly understand that venom extractor kits are ineffective and potentially harmful. None of the experts could recall seeing an extractor used in an emergency room or ambulance.



Impact of an extractor on a venomous snakebite. Photo credit: Ben Abo

## SNAKEBITES:

### What are the real risks?

There were **7,132** snakebites reported to U.S. poison centers in 2019, the most recent complete data set available.

In **3,272 (46%)** of these bites, the patient exhibited symptoms attributable to the snakebite that required treatment, such as swelling and ecchymosis, but were not life-threatening.

In **221 (3%)** of these bites, the patient exhibited symptoms that were life-threatening or resulted in significant residual disability or disfigurement.

There was only one reported death.

*Source: Gummin DD, Mowry JB, Beuhler MC, Spyker DA, Brooks DE, Dibert KW, Rivers LJ, Pham NPT, Ryan ML. 2019 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 37th Annual Report. Clin Toxicol (Phila). 2020 Dec;58(12):1360-1541. PubMed PMID: 33305966. Dec;58(12):1360-1541. PubMed PMID: 33305966.*

## A “talisman” that preys on fear

Their popularity among consumers persists, and the experts can only speculate as to why.

Some conjecture that extractors function as a talisman – a charm that hunters and others carry to ease their fears of encountering snakes in the wild. Others believe the extractors appeal to “preppers” – those adventurers who are contented only when they have prepared (or believe they have) for every potential scenario.

Extractor kits may hold appeal among the more casual outdoor enthusiasts, who find solace in the idea that if they suffer a snakebite, an extractor kit will empower them to do something about it.

“People feel really helpless when it comes to snakebites,” says Dr. Susanne Spano, Associate Professor of Clinical Emergency Medicine at the University of California San Francisco and Director of the Wilderness Medicine Fellowship. “They want to be able to do first aid. Kits like this prey on fear.”

The problem, according to the experts we interviewed, is that extractor kits do not provide adequate first aid for snakebites. In fact, medical experts universally say the best course of action for snakebites is to get to a hospital as quickly and as safely as possible. Every moment of time lost causes additional venom to spread through the surrounding tissue, increasing the potential for long-term damage and disability.

That would include any time spent deploying a venom extractor. Most of the experts we interviewed flagged the potential for losing time as their primary concern about extractors. Some also fear that using an extractor may provide a false sense of safety that diminishes the victim’s sense of urgency about getting to a hospital.

## Time is tissue

“Using an extractor simply delays getting care or gives the victim a sense of having done something,” says Dr. William Banner, Medical Director of the Oklahoma Center for Poison and Drug Information and a former president of the American Association of Poison Control Centers. “It’s rare that the person loses an arm or leg. They just lose time getting to the hospital, and that is critical. Time is tissue.”

## GET INVOLVED!

To support our campaign, you can make your voice heard in the following ways:

1

Post the link to this report on your social networks with the hashtag [#StopUsingVenomKits](#).

2

Follow our Twitter feed [@BTGPharma](#) for updates on this topic.

3

Be active and spread the word about venom extractor kits within the professional and community organizations you care about.

4

Speak to the managers of local retailers that are selling venom extractor kits. Ask for their email addresses and send them this report, or hand them the summary available on our website.

5

If you are a medical professional, volunteer to be available for media interviews on this topic by contacting Chris Sampson at [chris.sampson@btgsp.com](mailto:chris.sampson@btgsp.com).

Several physicians we interviewed repeated the emergency-medicine mantra “time is tissue” – commonly used to describe the need for urgent treatment of snakebites, as well as strokes, heart attacks and many other traumas. But conveying its message to action-oriented outdoorspeople is challenging, the experts agreed. Many suggested that telling the public to “do nothing and go to the hospital” simply isn’t enough to quell the fear of snakebites.

“It is a hard message to get to the public,” says Dr. Erica Liebelt, Executive and Medical Director of the Washington Poison Control Center and Clinical Professor of Pediatrics at the University of Washington School of Medicine. “We all want to actually do something, not just turn over the action steps to others.”

Dr. Liebelt suggests messaging that, rather than emphasizing inaction, focuses on the need to move quickly and safely to a hospital. Others concur and emphasize the need for reminders that death from snakebite in the United States is exceedingly rare. According to the 2019 Annual Report of the American Association of Poison Control Centers’ National Poison Data System, more than 7,000 snakebites were reported to poison centers in 2019, with only one death among them.

“To put minds at ease, we should talk about the high number of bites but low number of deaths,” says Jordan Benjamin, herpetologist and Founder of Asclepius Snakebite Foundation. “So there is time to get to the hospital. Why mess it up? Sometimes simplicity is good.”

The tools experts recommend carrying in case of snakebites are certainly simple: a permanent marker to trace the edge of the swelling and record the time to assess its progress, a cell phone to call 911 if needed and a set of car keys to get to the hospital, as fast as is safely possible. But Benjamin acknowledges that simple messages may not be enough to stop consumers from purchasing products purporting to offer additional protection.

“As humans, we don’t like simplicity,” he says. “It evokes fear.”

## **The solution: education**

Each of the experts we spoke to agreed that educating consumers and retailers is an important step toward ending the use of venom extractors for snakebites.

## **The following experts were interviewed in the preparation of this report.**

**Dr. William Banner**, Medical Director, Oklahoma Center for Poison and Drug Information

**Jordan Benjamin**, Herpetologist, Founder of Asclepius Snakebite Foundation

**Dr. Nick Brandehoff**, Toxicologist, President and Medical Director of Asclepius Snakebite Foundation, Attending Medical Toxicology Faculty, Rocky Mountain Poison and Drug Service, Assistant Clinical Professor, University of Colorado School of Medicine

**Dr. Sean Bush**, Emergency Physician, WakeMed and Wilderness Medicine Fellow, Yale School of Medicine

**Dr. Michael Caudell**, Clinical Professor of Emergency & Wilderness Medicine, Medical College of Georgia at Augusta University and Co-founder of MedWAR

**Dr. Nathan Charlton**, Associate Professor of Emergency Medicine, Program Director, Medical Toxicology Fellowship and Director, Wilderness Medicine Education Program, University of Virginia Health System

**Dr. Shane Dragan**, Emergency Medicine Physician; Assistant Professor, West Virginia University; and Assistant Director, Rural Emergency Medicine Institute

**Dr. Jeffrey Goodloe**, Professor and Chief of the EMS Section of the Department of Emergency Medicine at The University of Oklahoma School of Community Medicine

Many suggested intensive educational campaigns from outdoor organizations such as the Red Cross, Wilderness Medical Society, Sierra Club or the Boy Scouts of America. Those groups have strong followings that look to them for guidance in many areas of outdoor activity.

But membership of those groups primarily consists of dedicated, knowledgeable hobbyists who already understand how to manage through outdoor calamities such as snakebites or are frequently exposed to opportunities to keep their training up to date. Much harder to reach are the casual adventurers – the car campers and once-a-year backpackers. When they go shopping for outdoor gear, they are more likely to be attracted to a product promising venom removal.

“Most people who enjoy the outdoors are not outdoorsmen,” says Dr. Spencer Greene, Director of Toxicology and an attending emergency physician at HCA Houston Healthcare-Kingwood. “The audience for this consists of casual hikers.”

That cohort may be more easily reached through mass media, particularly in the spring when hometown newspapers and lifestyle magazines often write about human-snake interaction. Occasional enthusiasts also want to feel like they’re in the know.

“Give them something to know, something that experts are talking about,” says Dr. Bush.

*“The most effective way to prevent consumers from purchasing snake venom extractors would be to prohibit their sale.”*

The challenge is even greater in an era plagued by misinformation, all of it available within a few clicks and most of it indistinguishable from valid scientific data to the untrained eye.

“The internet equalizes everyone as far as knowledge base,” says Dr. Nick Brandehoff, toxicologist and President and Medical Director of Asclepius Snakebite Foundation. “Snakebites are one of those things. If Spencer Greene or I got on a forum and started talking, we are on the same level as a guy who was bitten by a nonvenomous snake when he was 4.”

Retailers could also be part of the solution – if they were to critically compare the marketing claims regarding snakebites

**Dr. Spencer Greene**, Director of Toxicology, Department of Emergency Medicine at HCA Houston Healthcare – Kingwood; Clinical Professor, University of Houston College of Medicine; Director, Houston Venom Conference

**Dr. Carlton Heine**, Clinical Associate Professor, Washington State University Elson S. Floyd College of Medicine

**Dr. Erica Liebelt**, Executive and Medical Director of the Washington Poison Center and Clinical Professor of Pediatrics at the University of Washington School of Medicine

**Dr. Rob Palmer**, Toxicologist and Paramedic, Attending Medical Toxicology Faculty, Rocky Mountain Poison and Drug Service, Adjunct Associate Professor at the University of Wyoming, and former President, American Academy of Clinical Toxicology

**Dr. Mark Ryan**, Director, Louisiana Poison Center, Assistant Professor, Clinical Emergency Medicine, LSU Health Shreveport

**Dr. Susanne Spano**, Associate Professor of Clinical Emergency Medicine, University of California San Francisco and Director, Wilderness Medicine Fellowship

made by venom extractors to the medical evidence, the responsible decision would be to remove them from their shelves.

Of course, one way to prevent consumers from purchasing snake venom extractors would be to prohibit their sale. The FDA has not yet weighed in on the kits' efficacy. But the agency does have a history of halting the sale of devices that purported to be effective in treating snakebites; it banned the promotion of stun guns for that purpose in 1990.

### **Danger ahead?**

In 2020, hospitals and poison centers around the country **reported** marked increases in snakebite victims. A warm, early spring across much of the South and COVID-19 restrictions that made outdoor activities more appealing – if only by eliminating most other activities – all likely contributed to an unusual number of human-snake interactions.

As COVID-19 has increased interest in outdoor activities, temperate weather could bring about more encounters between snakes and humans. That means everyone from hikers to gardeners, hunters to kids at play and sunbathers to bird watchers will be at increased risk of being bitten by copperheads, cottonmouths, their respective regional rattlesnakes and snakes of other types.

If treated promptly and appropriately, these bites are highly unlikely to cause lasting damage. But chances are that some of those victims could be carrying snake-venom extractor kits. If they use them, they'll be risking further, completely unnecessary damage to blood vessels around the wound. Even worse, if they delay getting to the hospital under the mistaken belief that the extractor removed venom, they'll be risking serious tissue damage and potential disability as the venom spreads through their tissue. While the number of deaths from snakebite venom is very small, the **CDC warns** that the number of deaths would be much higher if victims did not urgently seek medical care.

One way to avoid that fate is to make sure those consumers never purchase venom extractor kits – either because they know better, because retailers become part of the solution and decide to stop selling them or because the government prohibits their sale.

Until that happens, snakebite victims who use venom extractors are at risk of suffering unnecessary injury.

## Clinical Evidence

Venom extractors have been a focus of snakebite research – and have been found lacking – for more than **60 years**. More than two dozen clinical research studies and another 20 published editorials, guidelines and literature reviews support the findings of this report. These include:

**“Suction for Venomous Snakebite: A Study of ‘Mock Venom’ Extraction in a Human Model,”** by Michael B. Alberts, et al., in Annals of Emergency Medicine, 2004. [READ IT HERE.](#)

The authors found that the venom extractor “removed bloody fluid from our simulated snakebite wounds but removed virtually no mock venom, which suggests that suction is unlikely to be an effective treatment for reducing the total body venom burden after a venomous snakebite.”

**“Effects of a Negative Pressure Venom Extraction Device (Extractor) on Local Tissue Injury After Artificial Rattlesnake Envenomation in a Porcine Model,”** by Sean P. Bush, et al., in Wilderness and Environmental Medicine, 2000. [READ IT HERE.](#)

The authors concluded that venom extraction devices demonstrated no benefit and may have caused harm in a pig model of western diamondback envenomation.

**“Snakebite Suction Devices Don’t Remove Venom. They Just Suck,”** by Sean P. Bush in Annals of Emergency Medicine, 2004. [READ IT HERE.](#)

After a review of several studies of venom extractors, Dr. Bush concludes, “the Extractor does not work, and it could make things worse...We should stop recommending Extractors for pit viper bites, and the manufacturer should certainly stop advertising that they are recommended medically as the only acceptable first-aid device for snakebites.”

**“Skin Damage Following Application of Suction Device for Snakebite,”** by Christopher P. Holstege, MD, and Eunice M. Singletary, MD, in Annals of Emergency Medicine, 2006.

“A 7-year-old boy was bitten by a copperhead snake. A snake bite suction device was applied to the bite site. He presented to the emergency department 20 minutes after application of the suction device.” Click [this link](#) for a photo of “a well-circumscribed area of ecchymosis that corresponds to the suction device application cup. The primary area of significant skin injury in this case was the region associated with the suction device.”

Based on these and other studies, the [American Heart Association](#), American Red Cross, International First Aid and Resuscitation [Guidelines](#) and the [Boy Scouts of America](#) specifically advise against using suction. From the American Red Cross guidelines: “Suction has no clinical benefit and it may aggravate the injury.”

For a complete list of references, [CLICK HERE.](#)

## **ABOUT BTG SPECIALTY PHARMACEUTICALS**

BTG Specialty Pharmaceuticals provides rescue medicines typically used in emergency rooms and intensive care units to treat patients for whom there are limited treatment options. We are dedicated to the development, manufacture and commercialization of quality medicines that make a real difference to patients and their families. Our current portfolio of antidotes counteracts certain snake venoms and the toxicity associated with some heart and cancer medications.

To learn more, please visit: [btgsp.com](http://btgsp.com).

For more information, please contact:

**Chris Sampson**

Corporate Communications Director

[chris.sampson@btgsp.com](mailto:chris.sampson@btgsp.com)

+44 7413 649112