

# Spider bite

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A **spider bite**, also known as **arachnidism**, is an injury resulting from the bite of a spider. The effects of most bites are not serious.<sup>[1]</sup> Most bites result in mild symptoms around the area of the bite.<sup>[1]</sup> Rarely they may produce a necrotic skin wound or severe pain.<sup>[2]:455</sup>

Most spiders do not cause bites that are of importance.<sup>[1]</sup> For a bite to be significant, substantial envenomation is required. Bites from the widow spiders involve a neurotoxic venom which produces a condition known as latrodectism.<sup>[3]</sup> Symptoms may include: pain which may be at the bite or involve the chest and abdomen, sweating, muscle cramps and vomiting among others.<sup>[1]</sup> Bites from the recluse spiders cause the condition loxoscelism, in which local necrosis of the surrounding skin and widespread breakdown of red blood cells may occur.<sup>[4]</sup> Headaches, vomiting and a mild fever may also occur.<sup>[4]</sup> Other spiders that can cause significant bites include: the Australian funnel web spiders<sup>[5]</sup> and the South American wandering spider.<sup>[1]</sup>

Efforts to prevent bites include clearing clutter and the use of pesticides.<sup>[1]</sup> Most spider bites are managed with supportive care such as NSAIDs (including ibuprofen) for pain and antihistamines for itchiness.<sup>[6]</sup> Opioids may be used if the pain is severe.<sup>[6]</sup> While an antivenom exists for black widow spider venom, it is associated with anaphylaxis and therefore not commonly used in the United States.<sup>[6]</sup> Antivenom against funnel web spider venom improves outcomes.<sup>[1]</sup> Surgery may be required to repair the area of injured skin from some recluse bites.<sup>[6]</sup>

Spider bites may be overdiagnosed or misdiagnosed.<sup>[1]</sup> Historically a number of conditions were attributed to spider bites. In the Middle Ages a condition claimed to arise from spider bites was tarantism, where people danced wildly.<sup>[7]</sup> While necrosis has been attributed to the bites of a number of spiders, good evidence only supports this for recluse spiders.<sup>[1]</sup>

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Chelicerae of a black wishbone (nemesiid) spider, a mygalomorph

#### Classification and external resources

<b>Specialty</b>	Emergency medicine
<b>ICD-10</b>	T14.1 ( <a href="http://apps.who.int/classifications/icd10/browse/2016/en#/T14.1">http://apps.who.int/classifications/icd10/browse/2016/en#/T14.1</a> ) • T63.3 ( <a href="http://apps.who.int/classifications/icd10/browse/2016/en#/T63.3">http://apps.who.int/classifications/icd10/browse/2016/en#/T63.3</a> ) W57 (nonvenomous) X21 (venomous)
<b>ICD-9-CM</b>	989.5 ( <a href="http://www.icd9data.com/getICD9Code.ashx?icd9=989.5">http://www.icd9data.com/getICD9Code.ashx?icd9=989.5</a> ) • E905.1 ( <a href="http://www.icd9data.com/getICD9Code.ashx?icd9=E905.1">http://www.icd9data.com/getICD9Code.ashx?icd9=E905.1</a> ) • E906.4 ( <a href="http://www.icd9data.com/getICD9Code.ashx?icd9=E906.4">http://www.icd9data.com/getICD9Code.ashx?icd9=E906.4</a> )
<b>DiseasesDB</b>	12299 ( <a href="http://www.diseasesdatabase.com/ddb12299.htm">http://www.diseasesdatabase.com/ddb12299.htm</a> )
<b>MedlinePlus</b>	002858 ( <a href="https://medlineplus.gov/ency/article/002858.htm">https://medlineplus.gov/ency/article/002858.htm</a> )

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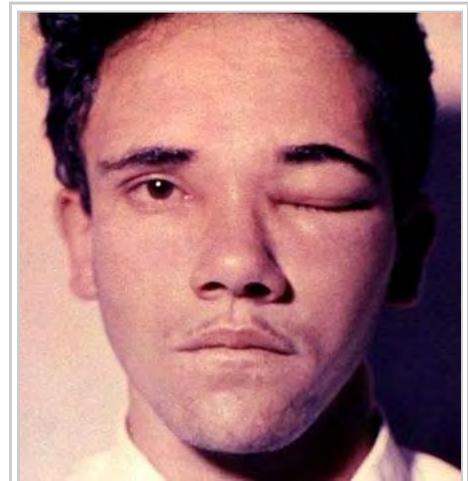
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## Signs and symptoms

Almost all spiders are venomous, but not all spider bites result in the injection of venom. Pain from non-venomous, so-called "dry bites" typically lasts for 5 to 60 minutes while pain from envenomating spider bites may last for longer than 24 hours.<sup>[8]</sup> Bleeding also may occur with a bite. Signs of a bacterial infection due to a spider bite occur infrequently (0.9%).<sup>[8]</sup>

A study of 750 definite spider bites in Australia indicated that 6% of spider bites cause significant effects, the vast majority of these being redback spider bites causing significant pain lasting more than 24 hours.<sup>[9]</sup> Activation of the sympathetic nervous system can lead to sweating, high blood pressure and gooseflesh.<sup>[10]</sup>

Most recluse spider bites are minor with little or no necrosis. However, a small number of bites produce necrotic skin lesions. First pain and tenderness at the site begin. The redness changes over 2 to 3 days to a bluish sinking patch of dead skin—the hallmark of necrosis. The wound heals slowly over months but usually completely.<sup>[11]</sup> and, rarely, widespread symptoms, including profound anemia. Rarely the bite may also produce the systemic condition with occasional fatalities.<sup>[12]</sup>



A Brazilian man 31 hours after having been bitten on his face by a recluse spider

## Cause

Spiders do not feed on humans and typically bites occur as a defense mechanism.<sup>[13]</sup> This can occur from

unintentional contact or trapping of the spider.<sup>[13]</sup> Most spiders have fangs too small to penetrate human skin.<sup>[14]</sup> Most bites by species large enough for their bites to be noticeable will have no serious medical consequences.<sup>[15]</sup>

Medically significant spider venoms include various combinations and concentrations of necrotic agents, neurotoxins, and pharmacologically active compounds such as serotonin. Worldwide only two spider venoms have impact on humans—those of the widow and recluse spiders. Unlike snake and scorpion envenomation,<sup>[16]</sup> widow and recluse species bites rarely have fatal consequences. However, isolated spider families have a lethal neurotoxic venom: the wandering spider in Brazil and the funnel web in Australia. However, due to limited contact of humans with these spiders, deaths have always been rare, and since the introduction of anti-venom in Australia, there have been no funnel web related deaths.<sup>[17]</sup>



4 months after a brown recluse spider bite with scar remaining

## Pathophysiology

A primary concern of the bite of a spider is the effect of its venom. A spider envenomation occurs whenever a spider injects venom into the skin. Not all spider bites involve injection of venom, and the amount of venom injected can vary based on the type of spider and the circumstances of the encounter. The mechanical injury from a spider bite is not a serious concern for humans. However, it is generally the toxicity of spider venom that poses the most risk to human beings; several spiders are known to have venom that can cause injury to humans in the amounts that a spider could inject when biting. While venoms are by definition toxic substances, most spiders do not have venom that is directly toxic (in the quantities delivered) to require medical attention and, of those that do, severity is typically mild.

Spider venoms work on one of two fundamental principles; they are either neurotoxic (attacking the nervous system) or necrotic (attacking tissues surrounding the bite). In some cases, the venom affects vital organs and systems. The venoms of the widow spiders, Brazilian wandering spider and Australian funnel-web are neurotoxic. Heart muscle damage is an unusual complication of widow venom that may lead to death.<sup>[18]</sup> Pulmonary edema, fluid accumulation in the lungs, is a feared uncommon complication of funnel-web venom.<sup>[17]</sup> Recluse and South African sand spider venoms are necrotic. Recluse venom may also cause severe hemolysis (destruction of red blood cells)<sup>[19]</sup>

## Diagnosis

Assumption that a reported injury was caused by a spider is the most common source of false reports, which in some cases have led to misdiagnosis and mistreatment, with potentially life-threatening consequences.<sup>[20]</sup> Many spider bites are relatively painless but the spider is often trapped and easily found. With neurotoxic envenomation, serious symptoms arise within a few hours.

An affected person may think that a wound is a spider bite when it is actually an infection with methicillin-resistant *Staphylococcus aureus* (MRSA).<sup>[21]</sup>

Spider bites are commonly misdiagnosed. Unverified bite reports are frequent and likely represent many other conditions, both infectious and non-infectious, which can be confused with spider bites.<sup>[22]</sup> Many of these

conditions are far more common and more likely to be the source of necrotic wounds.<sup>[4]</sup>

## Prevention

Efforts to prevent bites include clearing clutter and the use of pesticides.<sup>[1]</sup>

OSHA recommends that workers take following measures to prevent spider bite:

- Wear a long-sleeved shirt, hat, gloves, and boots when handling boxes, firewood, lumber, rocks, etc.
- Inspect and shake out clothing and shoes before getting dressed.
- Use insect repellants, such as DEET or Picaridin, on clothing and footwear.<sup>[23][24]</sup>

## Management

Most spider bites are harmless, and require no specific treatment. Treatment of bites may depend on the type of spider; thus, capture of the spider—either alive, or in a well-preserved condition, is useful.<sup>[25][26]</sup>

Treatment of spider bites includes washing the wound with soap and water and ice to reduce inflammation.<sup>[27]</sup> Analgesics and antihistamines may be used, however antibiotics are not recommended unless there is also a bacterial infection present.<sup>[27]</sup> Treatment of black widow envenomation seeks to control the pain and nausea that result.

In the case of bites by widow spiders, Australian funnel-web spiders, or Brazilian wandering spiders, medical attention should be sought immediately as in some cases the bites of these spiders develop into a medical emergency.<sup>[28][29]</sup> Antivenom is available for severe widow and funnel-web envenomation.<sup>[1]</sup>

## Necrosis

In almost all cases, recluse bites are self-limited and typically heal without any medical intervention.<sup>[4]</sup> Recommendations to limit the extent of damage include elevation and immobilization of the affected limb, application of ice. Both local wound care, and tetanus prophylaxis are simple standards. There is no established treatment for more extensive necrosis. Many therapies have been used including hyperbaric oxygen, dapsone, antihistamines (e.g., cyproheptadine), antibiotics, dextran, glucocorticoids, vasodilators, heparin, nitroglycerin, electric shock, curettage, surgical excision, and antivenom. None of these treatments conclusively show benefit. Studies have shown surgical intervention is ineffective and may worsen outcome. Excision may delay wound healing, cause abscesses, and lead to objectionable scarring.<sup>[30]</sup>

Dapsone, an antibiotic, is commonly used in the United States and Brazil for the treatment of necrosis. There have been conflicting reports with some supporting its efficacy and others have suggested it should no longer be used routinely, if at all.<sup>[31]</sup>

## Antivenom

Use of antivenom for severe spider bites may be indicated, especially in the case of neurotoxic venoms.<sup>[32]</sup> Effective antivenoms exist for *Latrodectus*, *Atrax*, and *Phoneutria* venom. In the United States antivenom is intravenous but is used rarely as anaphylactic reaction to the antivenom has resulted in deaths. In Australia, intramuscular antivenom was commonly used, but the use has declined. Doubt has been raised about the

effectiveness of antivenom.<sup>[33][34]</sup> An antivenom for *Loxosceles* bites is available in South America, and it appears antivenom may be the most promising therapy. However, the recluse antivenom is more effective in experimental animals when given early, patients do not often present until 24 or more hours after the event, possibly limiting the effect of this intervention.<sup>[35]</sup>

## Epidemiology

Estimating the number of spider bites that occur is difficult as the spider involvement may not be confirmed or identified.<sup>[14]</sup> Several researchers recommend only evaluating verified bites: those that have an eyewitness to the bite, the spider is brought in, and identified by expert. With "suspected arachnidism" the diagnosis came without a spider positively identified.<sup>[4]</sup>

### Africa

Several *Latrodectus spp* (button spiders) live in Africa. South Africa also has the six-eyed sand spider that may cause skin necrosis. Physicians are advised that the diagnosis may be difficult without a spider.<sup>[36]</sup>

### Australia

Bites by the redbacks (*Latrodectus hasselti*) number a few thousand yearly throughout the country. Antivenom use is frequent but declining.<sup>[37]</sup> Children may have less complications of bite.<sup>[38]</sup> Funnel web spider bites are few 30–40 per year and 10% requiring intervention. The Sydney funnel web and related species are only on the east coast of Australia.<sup>[39][40]</sup>

### Europe

In Switzerland about ten to one hundred spider bites occur per one million people per year.<sup>[41]</sup> During epidemics of latrodectism from the European black widow upwards of 150 bites/year were documented.<sup>[42]</sup>

### North America

The American Association of Poison Control Centers reported that they received calls regarding nearly 10,000 spider bites in 1994.<sup>[14]</sup> The spiders of most concern in North America are brown recluse spiders, with nearly 1500 bites in 2013<sup>[43]</sup> and black widow spiders with 1800 bites.<sup>[43]</sup> The native habitat of brown recluse spiders is in the southern and central United States, as far north as Iowa. Encounters with brown recluse outside this native region is very rare and bites are thought to be suspect.<sup>[4]</sup> A dozen major complications were reported in 2013.<sup>[43][44]</sup>

### South America

Numerous spider bites are recorded in Brazil with 5000/ annually. *Loxosceles* species are responsible for the majority of reports. Accidents are concentrated in the southern state of Parana with rates as high as 1/1000 people.<sup>[45]</sup> Bite from Phoneutria (Brazilian wandering spider) number in the thousands with most being mild. Severe effects are noted in 0.5% of cases, mostly in children.<sup>[46]</sup>

## Historical remedies

Recorded treatment from the 1890s for spider bites in general was rubbing in tobacco juice to the bitten skin,<sup>[47]</sup> similar to some of the traditional uses of the tobacco plant for various bites and stings from Central and South America.<sup>[48]</sup> Wild dancing and music was the cure for tarantism—the erotic frenzy believed to arise from the bite of a spider.<sup>[49]</sup> An antivenom was developed against wolf spiders in Brazil and used for decades. Wolf spiders have since been exonerated—they never caused illness.<sup>[50]</sup>

## See also

- ArachnoServer database
- Raventoxin
- Vanillotoxin

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## External links

- Medical Journal of Australia article gives statistics on the most frequent biters and the most serious bites. ([http://www.mja.com.au/public/issues/182\\_08\\_180405/isb10564\\_fm.html](http://www.mja.com.au/public/issues/182_08_180405/isb10564_fm.html))
- Richard S. Vetter and P. Kirk Visscher of the University of California at Riverside (<http://spiders.ucr.edu/dermatol.html>)
- Spider bites are an overrated menace (<http://www.dbskeptic.com/2008/02/03/spider-bites-are-an-overrated-menace/>)
- How to Tell the Difference between MRSA and a Spider Bite (<http://www.themrsa.com/how-to-tell-the-difference-between-mrsa-and-a-spider-bite/>)
- CDC—Venomous Spiders—NIOSH Workplace Safety and Health Topic (<http://www.cdc.gov/niosh/topics/spiders/>)

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Categories: Animal attacks | Parasitic infestations, stings, and bites of the skin | Toxic effects of venomous animals | Venomous spiders

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