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## **SPIDER BITES**

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### **Epidemiology**

There are over 3,000 species of spiders native to the United States. Due to fragility or inadequate length of fangs, only a limited number of species are capable of inflicting noticeable wounds on human beings, although several small species of spiders are able to bite humans, but with little or no demonstrable effect.

The final determination of etiology of 80% of suspected spider bites in the U.S. is, in fact, an alternate diagnosis. Therefore the perceived risk of spider bites far exceeds actual risk. Tick bites, chemical burns, lesions from poison ivy or oak, cutaneous anthrax, diabetic ulcer, erythema migrans from Lyme disease, erythema from Rocky Mountain Spotted Fever, sporotrichosis, *Staphylococcus* infections, Stephens Johnson syndrome, syphilitic chancre, thromboembolic effects of Leishmaniasis, toxic epidermal necrolysis, shingles, early chicken pox lesions, bites from other arthropods and idiopathic dermal necrosis have all been misdiagnosed as spider bites.

Almost all bites from spiders are inflicted by the spider in self defense, when a human inadvertently upsets or invades the spider's space.

Of spiders in the United States capable of biting, only a few are considered dangerous to human beings. Bites from the following species of spiders can result in serious sequelae:

## The Brown Recluse: *Loxosceles reclusa*



Photo Courtesy of the Texas Department of State Health Services

The most common species associated with medically important spider bites:

- Physical characteristics
  - Length: Approximately 1 inch
  - Appearance: A violin shaped mark can be visualized on the dorsum (top).
- Geographic range: The southern United States from California to Virginia and as far north as Nebraska, Iowa, Illinois, Indiana, and Ohio.
- Environment:
  - Warm climates (This species exists in all areas of Louisiana). The spider thrives in dry, secluded areas within warm climates.
  - Undisturbed areas in human dwellings or other structures (attics, basements, closets)
- Behavior:
  - Not aggressive; most bites are precipitated by accidental bites when the spider is trapped against the skin
- Consequences of bites:
  - Almost all bites heal spontaneously without major medical intervention. Most are unremarkable or require only minimal local care. Most commonly burning, itching, pain and redness develop within hours or days of the bite. Sometimes a “bulls eye” lesion (blue or purple area at the site surrounded by a whitish ring, and then a larger red ring) is apparent.
  - Very few bites result in serious wounds characterized by tissue necrosis.
  - Systemic symptoms observed can range from headache and body ache to rash, fever, nausea, and/or vomiting. Rarely these bites result in systemic life threatening illnesses, such as septicemia with renal damage.

Black Widow: The Southern Black Widow (*Latrodectus mactans*), Northern Black Widow (*L. varians*) and Western Black Widow (*L. Hesperus*).



Photo courtesy of the City of New Orleans  
Mosquito and Termite Control Board

The “Widow” spiders belong to a group of spiders known as comb-footed or cobweb spiders. Their webs are strong and irregular and are characterized by no definable pattern. The female Black Widow Spider is considered the most venomous spider in North America. Despite the ability to inject a powerful neurotoxin, the usual dose is small enough that the bite of the Black Widow rarely results in death, especially among healthy adults. The mortality rate from Black widow spider bites is less than 1%, although prior to the development of antivenom the Black Widow killed approximately 5% of human bite victims.

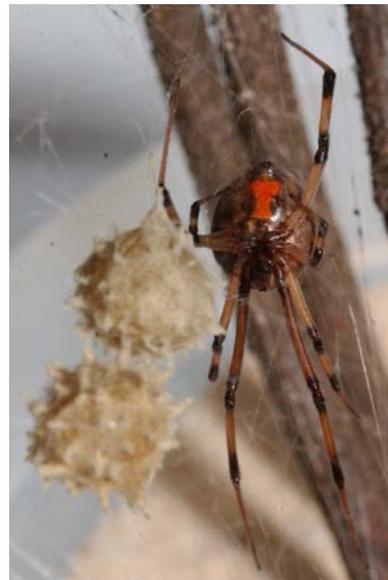
- Physical characteristics:
  - Length: The body, not including the legs, of the adult female is approximately ½ inch in length. With the legs extended the female measures approximately 1½ inches. Adult males are harmless and are about half the length of the female.
  - Appearance: The female has a shiny, jet black spherical abdomen with a characteristic red (also can be yellow or orange) “hourglass” marking on the ventrum (underside). The male has red spots along the dorsal midline with white lines or bars radiating to the sides. Juvenile males and females resemble the adult male and are also harmless.
- Geographic range: The Southern Black Widow is found primarily in the southeastern US, but is found from Florida to Pennsylvania/New York in the Northeast, and westward to Texas and Oklahoma. Southern Black Widows have also been discovered in California. The Northern Black Widow is found primarily in southeastern Canada and the northeast US. Western Black Widows are native to the western half of the US, southwestern Canada and most of Mexico.
- Environment:
  - Warm climate

- Dry, undisturbed places, often on the underside or within stored lumber, stacked pots, baskets, rodent burrows, water meters, piles of bricks, stones, or rocks, and dry crawl spaces. Females stay in the web.
- Behavior:
  - Not aggressive except when guarding egg sacs or clusters. These spiders usually prefer to flee. Most bites occur when the web is accidentally disturbed.
- Consequences of bites:
  - Envenomation by a Black Widow spider can cause a range of symptoms. Local consequences, such as pain, burning, swelling and redness at the bite site are often observed. Examples of systemic signs and symptoms are headache; rash; pruritis; increased perspiration, salivation, and/or lacrimation; nausea; vomiting; lethargy; muscle cramping; muscle pain; dizziness; restlessness; anxiety; edema of the eyelids; muscle rigidity, especially in the torso; tremors; and paralysis, especially of the legs.

Brown Widow: *Latrodectus geometricus*



Photos courtesy of the City of New Orleans  
Mosquito and Termite Control Board



Brown Widow Spiders (*Latrodectus geometricus*) have been found recently in areas of Louisiana. The female Brown Widow is also venomous, in fact the venom of the Brown Widow is more potent than that of the Black Widow, but usually very little venom is transferred in the bite, thus the consequences of envenomation are frequently less severe.

- Physical characteristics:
  - Length: The body, not including the legs, of the adult female is approximately ½ inch in length. With the legs extended the female measures approximately 1½ inches.
  - Appearance: The base coloration of this spider varies from light brown to mahogany, or dark brown, not jet black. An orange or yellow “hour glass” marking is present on the underside. The top surface of the abdomen has a distinct pattern of markings. The brown Widow also is characterized by prominent banding of the legs. The characteristic that most clearly differentiates the Brown Widow spider from the Black Widow is the surface texture of the egg case. The brown widow egg case is textured and rough in appearance (See photo above). The surface of the black widow egg case is smooth. These egg cases can be easily visualized within the tunnel section of the web, where the female spider lives.
- Geographic range: The Gulf Coast states from Florida to Louisiana. This species occurs worldwide in tropical areas.
- Environment:
  - Warm climate
  - The Brown Widow prefers secluded, protected sites in man made structures or in vegetation. Common locations are cluttered closets or garages, crawlspaces under houses or mobile homes, doorway corners, empty buckets, flower pots, mail boxes, old tires, recessed handles of garbage containers, and under eaves, shutters, yard furniture, tree branches and shrubs.
- Behavior:
  - Non-aggressive, bites only if provoked, among the least aggressive of the Widow spiders. These spiders will retreat when disturbed.
- Consequences of bites:
  - Symptoms similar to, but milder than those experienced with envenomation by the Black Widow.

Red Widow: *Latrodectus bishopi*



Photos courtesy of the Florida Department of Agriculture and Consumer Services

- Physical characteristics:
  - Length: The body, not including the legs, of the adult female is approximately ½ inch in length. With the legs extended the female measures approximately 1½ inches.
  - Appearance: The Red widow female has a reddish colored cephalothorax and a dark reddish brown to black abdomen. The underside of the abdomen may feature a red “hourglass” marking or may be characterized by a non-distinctive red mark. Orange and yellow spots are found on the dorsum.
- Geographic range: Found primarily in Florida
- Environment:
  - Warm climate
- Behavior:
  - Non-aggressive. The spider often bites when it is accidentally pressed against flesh.
- Consequences of bites:
  - Symptoms similar to those from envenomation by the Black Widow.

Hobo Spider: *Tegenaria agrestis*



Photo courtesy of the National Park Service

- Physical characteristics
  - Length: 1/3 to 2/3 inch in body length and 2/3 to 2 inches in leg span
  - Appearance: They are brown in color and their abdomens are characterized by several chevron shaped markings. Males are distinct in appearance from females. The males have two large palpi (mouth parts) that look like boxing gloves. Females have a larger and rounder abdomen than do males.
- Geographic range: Entered US prior to 1930 through the port of Seattle, Washington. This type of spider exists primarily in agricultural fields in Europe. Due to the lack of a natural enemy inside structures in North America, the Hobo Spider has adapted to urban environments and structures in the Pacific Northwest. The Hobo can be found in Washington, Oregon, Idaho, Montana, British Columbia and Alberta. Although experts do not project eventual spread south, they do not discount the possibility that the species can expand in range to the north and east, possibly to the eastern coast of the US and Canada.
- Environment:
  - Moist, cool climates
  - Hobo spiders are not good climbers and are usually found at ground level.
- Behavior:
- Most bites are by accidental contact with skin in clothing, bed sheets and other household items. The hobo spider is fairly aggressive but will generally avoid humans. Hobo spiders may be more aggressive to the point of attacking humans when guarding their egg sacs.

- Consequences of bites:
  - Very similar to bites of the Brown Recluse
  - The most common cause of necrotic arachnidism in the Pacific Northwest.

Yellow Sac Spiders: *Cheiracanthium inclusum* and *Cheiracanthium mildei*



*Cheiracanthium inclusum*  
Photo courtesy of Woodland Park Zoo



*Cheiracanthium mildei*  
Photo Courtesy of Univ. of Arkansas Arthropod Museum

These spiders may be responsible for most indoor bites.

- Physical characteristics
  - Length: Approximately ¼ - ¾ inch
  - Appearance: Light gray mixed with pale yellow, sometimes with a slight greenish tinge to the abdomen
- Geographic range: Most of North, Central and South America
- Environment:
  - Often are found in stored objects and clothing
  - Spin small white webs indoors, but outdoors in leaves, petals, or among stones they live in tubular sac-like structures open at both ends
- Behavior:
  - Not aggressive, bite only when threatened
- Consequences of bites:
  - Painful bite without serious sequelae, although the lesions may be slow to heal (8-10 days)
  - Never fatal

The following species of spiders are spiders found in Louisiana that can inflict painful bites, however no serious sequelae result.

House Spiders: Family *Theridiidae*



Photo courtesy of the City of New Orleans  
Mosquito and Termite Control Board

- Physical characteristics
  - Length: Varies, but the body is usually 3/8 inch in length or smaller
  - Appearance: Head and sternum are often tan or brown, the abdomen is usually characterized by black and white markings.
- Geographic range: Worldwide
- Environment:
  - Common in homes, barns, stables, and sheds.
- Behavior:
- House spiders are web-building spiders common in the corners and garages of most homes. These spiders are also known as "cobweb spiders."  
Consequences of bites:
  - The bite is considered harmless.

Wolf Spiders: Several species of the Family *Lycosidae*



- Physical characteristics
  - Length: ½ inch to 2 inches
  - Appearance: Hairy spiders, usually drab brown or gray in color with radiating marks on the head and thorax, providing camouflage for the specific environment. Wolf spiders are often confused with the Brown Recluse, but Wolf spiders lack the violin shaped marking on the dorsum.
- Geographic range: Worldwide
- Environment:
  - Found in just about all environments in coastal and inland areas.
  - Common household pest in the fall when they are looking for a warm place to spend the winter.
- Behavior:
  - Not aggressive, but will bite if provoked.
- Consequences of bites:
  - The bite is not usually considered dangerous to humans, but swelling, pain, and itching may result.

Jumping Spiders: Species of the Family *Salticidae*, the largest Family of spiders, 5000 species (about 13 % of all spider species)



Photo courtesy of Extension Entomology, Texas A&M University

- Physical characteristics
  - There is not one distinct color and pattern ascribed to this spider. In fact these spiders can also mimic ants and beetles.
  - Jumping spiders are usually identified by the pattern of their large eyes. Typically they have eight eyes arranged in three or four rows. The front row is enlarged and the others are situated back on the cephalothorax.
- Geographic range: Worldwide, but most live in the tropics.
- Environment:
  - Found in many diverse environments.
- Behavior:
  - These spiders can jump 20 to 80 times the length of their body on a silk tether. They often jump backward when threatened, but keep facing forward toward the threat.
  - Usually they will run and hide, but will bite when cornered and provoked.
- Consequences of bites:
  - Except for the bites of very large jumping spiders, there are very little consequences from the bite. The bites of some large jumping spiders can be quite painful, some as severe as a bee sting.

## Clinical Appearance of Spider Bites

Any spider bite may result in itching, pain and varying degrees of swelling that might persist from a few hours to several days. Rarely small puncture wounds are visible. Sometimes a pale circular area surrounded by a ring of redness is evident (especially in bites by Widow spiders and Brown Recluses). Infants and small children may be more severely affected. Usually the swelling and itching lasts only a few days. Ninety percent of spider bites heal spontaneously with no serious sequelae.

Widow spider bites may progress to more severe effects. The bite of a Widow spider is often very painful and the victim will commonly note the presence of the spider. Nevertheless on occasion the bite will not be prominent and severe systemic symptoms may still occur. Envenomation with the neurotoxin of the Widow spider causes a set of symptoms in the bite victim known collectively as latrodectism. Numbness and tingling sensations at or near the bite site can progress to headache, lethargy, increased sweating, cramps, rigidity of the abdominal musculature and legs, tightness of the chest, dizziness, nausea, vomiting and difficulty breathing. Rashes can appear both near the bite site and in distant sites. Abdominal pain can be intense. Symptoms usually begin between 15 and 60 minutes after the bite and peak within one to three hours. Symptoms are usually completely dissipated within 12 to 24 hours. As stated previously, less than 1% of the victims will die.

Besides being red and swollen, Brown Recluse bites can form blisters and eventually ulcerate; sometimes necrotic ulcerations result. In some cases a “bulls eye” lesion characterized by a blue or purple area around the bite, surrounded by a white ring, then a larger red outer ring can be seen. Fever, chills, nausea, vomiting and a rash may result. Kidney failure, clotting abnormalities and respiratory distress may occur in severe cases.

All spider bites may potentially result in allergic reactions of varying severity. Some allergic reactions may be life threatening and require emergency care.

## Diagnosis

As stated previously, various skin lesions are often misdiagnosed as spider bites. Most victims do not recall the bite, a fact that complicates diagnosis. Increased incidence of lesions caused by Methicillin-resistant *Staphylococcus aureus* (MRSA), an organism that frequently causes skin furuncles and abscesses, may be responsible for a great number of suspected spider bites. The purulent MRSA lesion should not be mistaken for the necrotic lesion characteristic of severe spider bites. Also, secondary infections of spider bites by MRSA appear to be extremely rare. A recent study indicates that there is no epidemiologic link between spiders and MRSA infections.

It is important to remember that spiders usually bite only once, therefore a patient with multiple bites is more likely to have been bitten by other arthropods such as bed bugs, biting flies, fleas or ticks. Also, if multiple persons from the same location are affected, spiders are likely not the culprits.

Diagnosis cannot be made solely on the appearance of the skin lesion. But diagnosis is often based on physical symptoms and the appearance of the bite.

Confirmation is only possible by witnessing the bite and the recovery of and proper identification of the spider. Spiders should be carefully collected in a container with a tight fitting lid and should accompany the patient to the medical treatment facility. Assays that detect spider venom in biopsies and/or hair samples are presently being developed but are not widely available.

## **Therapy**

The toxin of most species causes only local pain, redness and swelling. However bites from the following species may require specific treatment regimens.

### **Black widow bites**

Victims of Black Widow bites are cautioned to remain calm and seek medical attention immediately (physician, hospital or poison control center). First aid should consist of application of an ice pack to the bite site to relieve pain and swelling. The spider, if available, should be collected in a plastic bag or other plastic or glass container.

Parenteral narcotics or muscle relaxants (e.g., methocarbamol and diazepam) may be used to control pain. Calcium gluconate 10 percent given intravenously may relieve pain and muscular rigidity. Antivenom (*Lyovac*) is rarely indicated and is usually reserved for use in patients that do not respond to initial measures, usually the elderly and very young.

When antivenom is used only a single 2.5 ml vial is required. Specific antivenom is derived from horse serum, therefore, assessment of horse serum sensitivity is essential prior to antivenom use.

### **Brown recluse bites**

First aid procedures include washing the area well with soap and clean water. Application of an icepack is recommended to reduce redness and swelling. An antibiotic lotion should be applied, when possible, to prevent infection. The victim should seek emergency care for further treatment.

Brown Recluse bites can progress to extensive local necrosis; therefore some physicians recommend early excision of the bite site. Other practitioners prefer use of corticosteroids. Dapsone and colchicine have also been used in therapy.

## **Control Measures**

Prevention:

The optimum time to check for spider activity is at night. Areas should be illuminated with a flashlight. Care must be taken in removing webbing, since many spiders remain secluded in small web enclosures.

- Non-chemical
  - Persons cleaning or working in areas that have been largely unlit or undisturbed for periods of time are advised to wear gloves. Examples of such areas are crawl spaces beneath homes; piles of lumber, tiles, concrete blocks, or old newspapers; and storage closets or sheds. Spiders are also found in the folds of clothing, in work, gardening, or utility gloves, in infrequently worn shoes, inside or under storage boxes or containers, behind shutters and in other rarely accessed spaces.
  - Routine cleaning and sanitation of storage spaces is recommended. Vacuuming successfully removes spiders and egg sacs. The vacuum bag should be removed and placed in a sealed plastic bag immediately after vacuuming.
  - Clutter and debris should be removed from outside areas.
  - Webs are often found near lighted passageways. Lights that emit yellow illumination (“bug lights”) will prevent web building.
  - Cracks or spaces around windows and doors should be sealed.
  - Maintain window screens in good repair.
  - Control other nuisance arthropods. Roaches, flies and other insects often serve as prey for spiders and large populations of these insects may attract spiders.
- Chemical
  - Insecticides may also be used to treat areas for spiders. Some of these products are labeled for use by the general public and some can only be utilized by licensed applicators. **Always carefully read the label of pesticides. Products should be used according to labeled instructions.** Direct contact with a non-residual aerosol spray is effective in removing adult spiders. Treatment of small areas with a residual insecticide may be helpful in preventing new spiders from becoming established. Insecticidal dusts applied to cracks and spaces prior to sealing, reinforces exclusion of the pests.

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