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Australian Doctor.

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## Suspected spider bite

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### Definition, clinical features and epidemiology

EACH year thousands of calls about spider bites are made to poisons information centres around Australia. There has been significant misinformation about spiders and the effects of suspected spider bites in Australia, particularly in relation to necrotic arachnidism (necrotic ulcers or skin lesions that occur after a spider bite).

Information on the clinical effects of spider bite is based mainly on case reports and small cases series, and

in many reports the spider has not been caught or identified by an expert.

A recent study of 750 definite spider bites,<sup>1</sup> in which the spider was collected at the time of the bite and identified by an expert, has improved our knowledge, and much of the following review is based on that study and subgroup analyses of it.

A discussion of spider bite requires an understanding of what constitutes good evidence in clinical toxicology

and the conditions that must be met to establish definite spider bite cases. For a spider bite to be regarded as a definite bite by a particular species, all of the following must be satisfied:

- Evidence of a bite, including clinical effects such as discomfort or pain at the time or soon after the bite.
- Collection of the spider at the time or immediately after the bite.
- Identification of the spider by an expert arachnologist. Both the gen-

eral public and clinicians often incorrectly identify spiders. Management of patients can be based on clinical findings and an algorithm that does not require spider identification (see later). When identification is required, spiders can be identified by a local museum or they can be sent to the author (see page 31 for contact details).

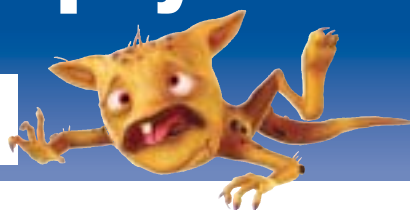
Pain or discomfort is a universal *cont'd next page*



With this issue a guide to spider bite

## Stop Digger Dermatophyte in his tracks!

**PBS Information:** Authority required. Refer to PBS schedule for full authority benefit information.



Lamisil tablets are effective and well tolerated in diabetic patients<sup>1</sup>

Before prescribing, please review approved Product Information, which is available on request from Novartis Pharmaceuticals.

NOVARTIS Pharmaceuticals Australia Pty Ltd (ACN 004 244 160) 54 Waterloo Rd, North Ryde NSW 2113. Telephone (02) 9805 3555. ®=Registered Trademark

1. Farkas B et al. Terbinafine (Lamisil) treatment of toenail onychomycosis in patients with insulin-dependent and non-insulin dependent diabetes mellitus: a multicentre trial. *British Journal of Dermatology* 2002; 148: 254-260 2. Darkes MJM et al. Terbinafine. A review of its use in onychomycosis in adults. *American Journal of Clinical Dermatology* 2003; 4(1): 39-65.



High cure rates. Short treatment times.<sup>2</sup>

from previous page

finding in spider bite and the prolonged absence of pain is strong evidence against a bite. The characteristics of the pain, including duration and an initial increase in pain or radiating pain are often helpful in distinguishing effects of different spider bites. Other important local effects include:

- Fang marks or bleeding, which indicate the size of the fangs and of the spider.
- Erythema or red mark, which is variable in size but is found in 60-80% of spider bites.
- Itchiness (immediate or delayed). Swelling and oedema are uncommon findings.

In the study of 750 spider bites referred to above, 82% were caused by six major families of spiders. Most bites caused only minor effects and did not require treatment in a health care facility. Exceptions were



**Wolf spider**  
(Courtesy of Monash Venom Group).

medically significant bites (44 [6%]), most (37) by red-back spiders (*Latrodectus hasselti*).

Table 1 lists the medically important and common families of spiders in Australia. Some of the common and important spiders are pictured throughout this article. Most bites occurred in the warmer months and occurred between 8am and midnight.

Common name and important members	Spider family	% of bites
Huntsman spiders	Sparassidae	23
Orb weavers	Araneidae	21
White-tail spiders, including <i>Lampona</i> spp	Lamponidae	16
Comb-footed spiders, including widow spiders ( <i>Latrodectus</i> spp) and cupboard spiders ( <i>Steatoda</i> spp)	Theridiidae	11
Wolf spiders	Lycosidae	6
Jumping spiders	Salticidae	5
Black house spiders	Desidae: <i>Badumna</i> spp	3
Sac spiders, including <i>Cheiracanthium</i> spp	Clubionidae	2
Mouse spiders	Actinopodidae: <i>Missulena</i> spp	2
Funnel-web spiders ( <i>Atrax</i> spp and <i>Hadronyche</i> spp)	Hexathelidae, Atracinae	1
Trapdoor spiders	Idiopidae and Nemesiidae	2
Whistling spiders, or 'tarantulas'	Theraphosidae	1

An approach to the diagnosis of suspected and definite spider bites

IT is not uncommon for patients to present with signs and symptoms, including skin lesions or necrotic ulcers, that they attribute to a spider bite. It is essential in these cases that the history of a spider bite be confirmed or excluded. If there is no history of a bite, the diagnosis and investigation must focus on the important causes of necrotic ulcers, including infectious, inflammatory, vascular and neoplastic aetiologies. An approach to this is outlined in table 2.

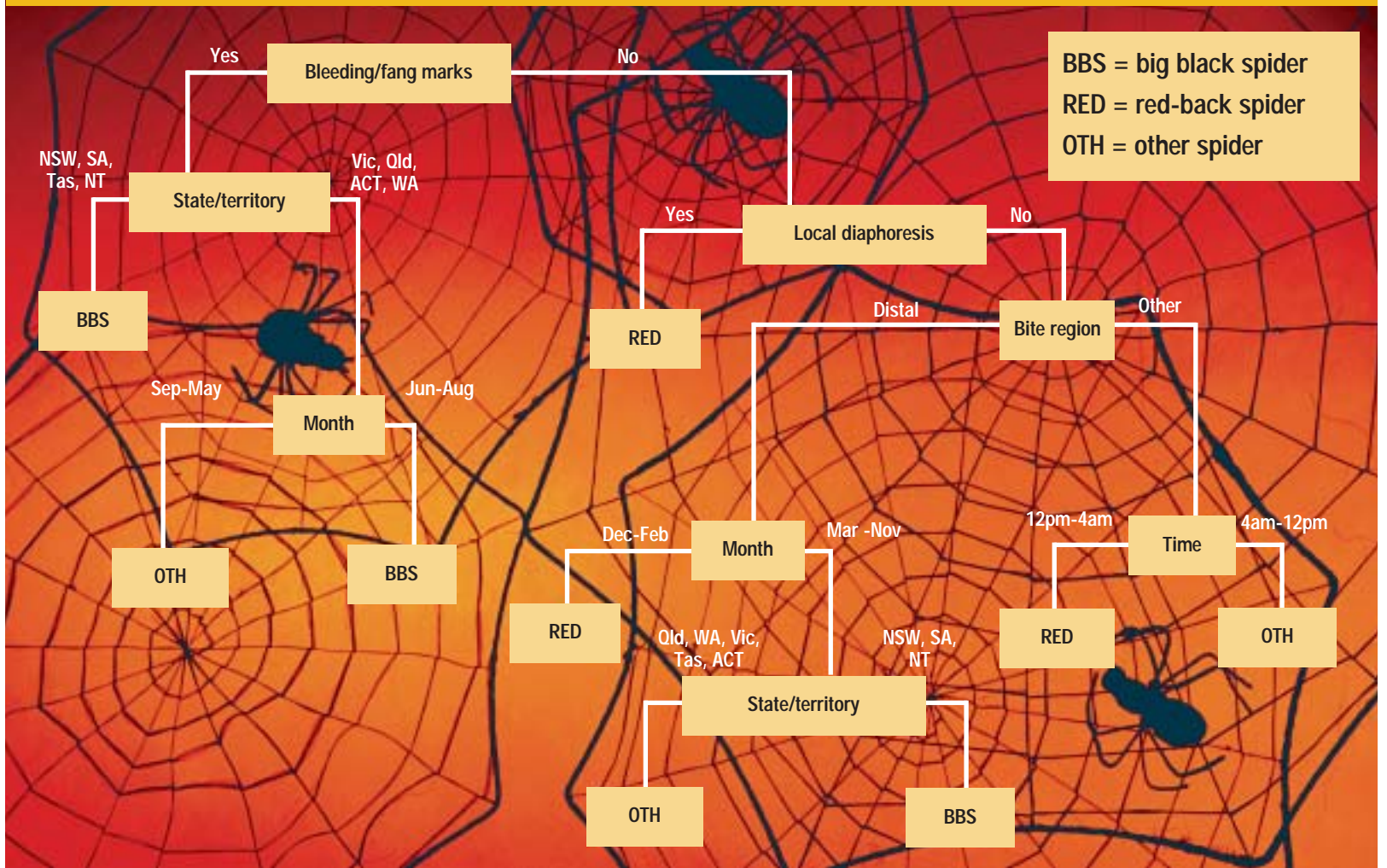
When there is a history of a definite bite, particularly if the spider is collected at the time, any symptoms can be attributed to the bite and the appropriate management instigated. The management of definite spider bite requires reliable information on the effects of spiders in the region where the spider is found.

In Australia, definite spider bites can be divided into bites by three clinically relevant groups: big black spiders, red-back spiders, and all other spiders. Big black spiders include funnel-web spiders, mouse spiders and other mygalomorphs (large primitive spiders, including trapdoor spiders). All bites by these spiders should be treated initially as suspected funnel-web bites in eastern Australia until no evidence of envenoming is established.

Although red-back spider envenoming is not a rapidly developing condition or likely to be life threatening, recent evidence suggests that it often causes significant pain and other unpleasant symptoms.

The remaining spiders responsible for bites in Australia cause minor effects only, so if the person has not been bitten by either a big black spider or a red-back

Figure 1: Decision tree for predicting types of spider bites (also available online at [australiandoctor.com.au](http://australiandoctor.com.au) in the How to Treat section of our web site).



**White-tail spider attacking a black house spider (eating a fly).**



spider (and some related species), they can be reassured there will be no major effects (table 3).

Probable bites by medically important spiders should be managed according to their clinical effects. Suggested treatment advice is included in table 3. More

detailed information on the management of red-back spider or funnel-web envenoming is discussed later.

Information on early clinical effects, circumstances of the bite and geographical distribution of spiders can be used to help make the diagnosis of a particular spider bite.

A diagnostic algorithm that can distinguish between bites of big black spiders (including funnel-web spiders), red-back spiders and all other spiders has been developed from information collected in 789 definite spider bites. It can be used in any case in which there is a definite history of a spider bite, whether the person collected the spider or not, but they need to have seen a spider biting.

The algorithm involves obtaining information from six questions (table 3) to determine the spider type and path through the decision-tree algorithm (figure 1). This algorithm accurately classified 47 out of 49 big black spider bites (96%), and no funnel-web spider

bites were incorrectly classified (100% sensitivity). It is hoped that this algorithm will improve the identification of spiders in patients presenting to a doctor or asking for advice by phone after a spider bite.

In patients with definite or probable bites when the spider was not collected or described, the algorithm will allow the doctor to give immediate treatment advice based on the known effects of that spider group. It should help health care workers in diagnosing and managing medically significant spider bites, but should not replace good clinical judgment.

Unfortunately, the specificity of the algorithm means

that several harmless spiders are classified as big black spiders. This may be improved with further research and refinement of the algorithm.

### Necrotic arachnidism and white-tail spider bite

Necrotic arachnidism refers to necrotic ulcers or skin lesions that occur after a spider bite. The condition is recognised in many parts of the world but there is only good evidence for necrotic arachnidism occurring after bites by *Loxosceles* spiders ('recluse spiders'). There is little evidence for the involvement of other spiders although many groups of spiders continue to be blamed for necrotic arachnidism.

In Australia, the term necrotic arachnidism arose in the early 1980s, with several cases of ulcers being reported after a suspected bite, often after gardening. It was suggested that these ulcers were the result of a spider bite, and several spiders were implicated, including white-tail spiders (*Lampona* spp), wolf spiders (family Lycosidae) and, later, the black house spider (*Badumna* spp).

After this there were reports of several suspected cases of white-tail spider bite but in none of these was the spider caught or identified, and often was not even seen biting the patient.

Necrotic arachnidism is now commonly referred to in Australia as white-tail spider bite and the terminology is accepted by a large number of medical practitioners. The considerable publicity and general acceptance of the condition has led to an increased diagnosis of the condition by medical practitioners, despite the absence of evidence of a spider bite.

**Table 2: An approach to the investigation and diagnosis of necrotic skin ulcers presenting as suspected spider bites\***

<b>Establish whether or not there is a history of spider bite</b>	
■ Clear history of spider bite (better if spider is caught):	— Refer to information on definite spider bites
■ No history of spider bite:	— Investigation should focus on the clinical findings: ulcer or skin lesion
	— Provisional diagnosis of a suspected spider bite is inappropriate
<b>Clinical history and examination</b>	
■ Important considerations:	— Features suggestive of infection, malignant processes or vasculitis
	— Underlying disease processes: diabetes, vascular disease
	— Environmental exposure: soil, chemical, infective
	— Prescription medications
	— History of minor trauma
■ Specific historical information about the ulcer can assist in differentiating some conditions:	— Painful or painless
	— Duration and time of progression
	— Preceding lesion
<b>Investigations</b>	
■ Skin biopsy:	— Microbiology: contact microbiology laboratory before collecting specimens so that appropriate material and transport conditions are used for fungi, <i>Mycobacterium</i> spp, and unusual bacteria
	— Histopathology
■ Laboratory Investigations: may be important for underlying conditions (autoimmune conditions, vasculitis), including, but not be limited, to:	— Biochemistry (including liver and renal function tests)
	— FBC and coagulation studies
	— Autoimmune screening tests, cryoglobulins
■ Imaging:	— Chest radiography
	— Colonoscopy
	— Vascular function studies of lower limbs
<b>Treatment</b>	
■ Local wound management	
■ Treatment based on definite diagnosis or established pathology	
■ Investigation and treatment of underlying conditions may be important, (eg, pyoderma gangrenosum or diabetes mellitus)	
<b>Follow-up and monitoring</b>	
■ The diagnosis may take weeks or months to be established, so patients must have ongoing follow-up.	
■ Continuing management: co-ordinated with multiple specialities involved	

\*Adapted from: Isbister GK, Whyte IM. Suspected white-tail spider bite and necrotic ulcers. *Internal Medicine Journal* 2004; 34(1-2):38-44.

**Table 3: Questions for the spider bite diagnostic algorithm, and the recommended treatment advice\***

<b>Questions</b>
■ Are puncture marks, fang marks or bleeding present at the bite site?
■ In which state/territory did the bite occur?
■ Is there localised diaphoresis?
■ In which month did the bite occur?
■ At what time of day did the bite occur?
■ Where is the bite region (distal site or not)?
<b>Treatment advice</b>
<b>Big black spiders</b>
■ The patient should be observed in hospital for four hours and can be discharged if they remain asymptomatic or have only local effects. Patients at home should be advised to remain immobile, apply a pressure bandage and call an ambulance.
<b>Red-back spiders</b>
■ Patients with a red-back spider bite should be observed and antivenom considered if there are severe local or systemic features. Discharged patients should be advised about the effects of red-back spider bite and to return if they have systemic effects or worsening pain. It is advisable to follow up patients at 6-12 hours (particularly children). Patients at home should be given information on red-back spider bite, including the chance of systemic effects and severe persistent pain. They should be advised to attend hospital or an ED if they have worsening pain or systemic effects. They do not require urgent transport to hospital.
<b>Others</b>
■ Reassure the patient and discharge home. If patient is at home, they do not require medical attention.

Note: In cases where the algorithm (figure 1) suggests bites by red-backs (RED) or other spiders (OTH) but the patient clearly describes a 'big black spider', advice should be given as per big black spiders, (ie, this information overrides the conclusion from the algorithm).

\*Adapted from: Isbister GK, Sibbritt D. Developing a decision tree algorithm for the diagnosis of suspected spider bites. *Emergency Medicine* 2004; 16(2):161-66.

There are several published cases demonstrating misdiagnosis of necrotic arachnidism, failure to diagnose the correct underlying condition and delay in appropriate treatment. In the most recent study,<sup>2</sup> 11 cases of suspected white-tail spider bite were found to have alternative diagnoses, including dermatophytoses, staphylococcal infections, pyoderma gangrenosum, cutaneous polyarteritis nodosa, *Nocardia braziliensis* infection and an infected diabetic ulcer.

In a prospective study of 130 white-tail spider bites<sup>3</sup> there were no cases of necrotic ulcers. Definite bites by white-tail spiders caused pain in only one-fifth of patients, pain and a red mark lasting less than 24 hours in about one-third and, in the most severe

group, a persistent red mark and associated itchiness, pain or lump that lasted for seven days on average, in 44%.

Analysis of bites by black house spiders and wolf spiders also confirmed that these spiders do not cause necrotic ulcers. Australian wolf spider bites cause minor effects (table 4). Bites by the common garden wolf spider caused significantly more itchiness and redness, and larger wolf spiders more often caused severe pain and left fang marks.

Current evidence suggests that spider bites are very unlikely to cause necrotic lesions and any cases of necrotic ulcers presenting as suspected spider bites should be thoroughly investigated for other causes. Hopefully the myth of the white-tail spider will slowly be forgotten.



Huntsman spider.

**Table 4: Clinical effects of bites by important spider groups (genus or family) in Australia (Adapted from: Isbister and White, 2003.<sup>4</sup>)**

Clinical effects (%)	<i>Latrodectus</i> (red-back spiders)	<i>Steatoda</i> (cupboard spider)	Sparassidae (huntsman)	Araneidae (orb weavers)	Lycosidae (wolf spiders)	<i>Lampona</i> (white-tail spiders)	Atracinae (funnel-web spiders)	<i>Missulena</i> (mouse spider)
Severe pain	62%	26%	27%	17%	24%	27%	56%	77%
Duration of pain <sup>a</sup>	36 hours	6 hours	5 min	5 min	10 min	5 min	120 min	45 min
Radiating pain	38%	13%	4%	3%	7%	2%	13%	38%
Fang marks/bleeding	6%	17%	54%	32%	33%	19%	81%	54%
Redness/red mark	74%	96%	57%	71%	67%	83% (44%) <sup>b</sup>	31%	38%
Itchiness	38%	48%	14%	15%	13% <sup>c</sup>	44%	0	0
Systemic effects <sup>d</sup>	35%	30%	4%	10%	7%	9%	31% (13%) <sup>e</sup>	38%
<b>Circumstances:</b>								
Indoors	56%	78%	56%	52%	48%	95%	37%	69%
Night (6pm-6am)	37%	30%	26%	23%	37%	64%	25%	15%
Winter (May-Aug)	12%	26%	17%	8%	17%	5%	25%	23%
Typical activity (%)	Putting on shoe (28%)	Dressing (48%)	Interfering with spider (76%)	Washing-related (41%)	—	Trapped between material and skin (63%)	Garden-related (44%)	—
Distal limb bite	46%	52%	82%	34%	72%	25%	81%	92%

<sup>a</sup>Median duration of pain.

<sup>b</sup>44% of cases had a persistent red mark with itchiness, pain or a lump for a median of seven days.

<sup>c</sup>Itchiness occurred in 33% of bites by the common garden wolf spider.

<sup>d</sup>Systemic effects were mainly nausea, vomiting, headache and malaise.

<sup>e</sup>13% (two cases) had severe neurotoxicity requiring antivenom.

## Definite spider bites

TABLE 4 (previous page) provides a summary of the clinical effects and circumstances of bites in the medically important groups of spiders, and the spiders that most commonly cause bites. The initial management of red-back spider bite and funnel-web bite is included in table 3 (previous page). More severe cases require antivenom and should be referred to an emergency department for ongoing management.

### Red-back spider bites

Red-back spider bites cause a clinical syndrome often referred to as latrodectism, which is responsible for significant morbidity in Australia. It has been estimated that there are at least 5000 red-back spider bites annually in Australia, but there is significant geographical variation, with far more bites in the temperate regions of Australia, and far fewer in the colder south or tropical north.

Retrospective studies appear to have underestimated the severity of cases and, importantly, the frequency and duration of severe pain. A recent prospective study of 68 red-back spider bites, in which all cases were followed up, showed severe and persistent pain in two-thirds of cases, severe enough to prevent the patient sleeping in almost one-third of all cases (table 4).<sup>5</sup> This study also suggested that more patients should receive treatment (antivenom) on the basis of pain alone and not just systemic effects.

Red-back spiders tend to occur in dry and dark places, and the circumstances of the bite may be useful for making the diagnosis. A common way to be bitten is by putting on a shoe with the spider in it. These spiders are also found under outdoor furniture, in bike helmets and pot plants, and occasionally in clothes or shoes left lying around.

The appearance of the spider means that most people are able to identify it, but in a proportion of cases the spider is not seen at the time of the bite. Bites are far more common from the larger female spiders, although bites by juvenile spiders also occur.

In the prospective study<sup>5</sup> there was no difference between the effects of female and juvenile spiders. The male red-back spider is much smaller and rarely responsible for bites, although two cases have been reported.

Red-back spider bites can occur throughout the year but are most common between January and April. They are characterised by pain (localised, radiating and regional) associated with non-specific systemic features, local and regional diaphoresis and, less commonly, other autonomic and neurological effects (tables 4 and 5).

The pattern of the pain is characteristic, increasing over the first hour in more than half of cases. It may radiate proximally (from a distal limb bite) and less commonly to the trunk. The bite may only cause an initial irritation or discomfort, which may be the reason the spider is not seen in some cases.

Red-back spiders are small and rarely leave puncture marks or cause bleeding at the bite site. Erythema is the most common finding at the bite site and local diaphoresis occurs in about one-third of cases. Swelling is uncommon.

Systemic effects (listed in table 5) include nausea, vomiting, lethargy, malaise and headache. Hypertension, generalised myalgia and muscle spasms are often reported in the literature but are less common in large series of cases.

The effects of envenoming usually lasts about 1-4 days and in the prospective study<sup>5</sup> almost all cases completely resolved within one week. No deaths have been reported since the mid-1950s.

The diagnosis, particularly if a spider is not seen, is clinical, and a combination of the circumstances of the bite, the character of the pain, and local or regional diaphoresis is often enough to make this diagnosis. However, in children and especially in infants, the diagnosis may be more difficult. Infants may simply present with irritability and distress.

The treatment of red-back spider bite varies considerably based on the perceived severity of most bites and concerns about the effectiveness and safety of antivenom. The recent prospective study in Australia suggests antivenom should be considered in up to two-thirds of cases.<sup>5</sup>

When a patient has systemic effects and severe or persistent local pain, it is reasonable to explain that the pain may persist for 24-96 hours and allow the patient to choose whether to have antivenom. Local analgesia may be effective in the most minor cases but in most cases oral and even parenteral opiates have been ineffective.

Patients who require no treatment can be discharged but should be given clear instructions to return if the pain increases, systemic effects occur or they are unable to tolerate persistent pain.

Because of the slow development of the effects of envenoming (often 4-12 hours) it is unnecessary to observe these patients. If children are discharged home without treatment it is prudent to contact the parents or carers after 6-12 hours, as well as giving them instructions to return if the child's condition becomes worse.

There is increasing evidence that intramuscular antivenom is less effective than previously believed, and controlled studies are being undertaken to determine whether IV antivenom is more effective. However, the recommendation of the manufacturer is

Table 5: Clinical effects of red-back spider bites

#### Local and regional effects

- Local pain: increasing pain at the bite site over a period of minutes to hours. The pain may last for well over 24 hours
- Radiating pain: from the bite site to the proximal limb, trunk or local lymph nodes
- Local sweating
- Regional sweating: unusual distributions of diaphoresis, usually associated with the site of the bite
- Piloerection
- Local erythema

#### Systemic effects

- Remote or generalised pain or generalised myalgia
- Abdominal pain (differential diagnosis: acute abdomen)
- Nausea, vomiting and headache
- Malaise and lethargy
- Hypertension
- Irritability and agitation\*
- Fever
- Paraesthesia
- Chest pain (differential diagnosis: acute MI)
- Muscle spasms
- Patchy paralysis

\*More common in children



Red-back spider.



Funnel-web spider.

administered over 20-30 minutes) and premedication is not recommended. However, the antivenom should not be administered undiluted or rapidly because this may cause complement-mediated reactions.

Serum sickness after 4-15 days, characterised by fever, rash, arthralgia, myalgia and non-specific systemic features, is uncommon, but patients should be warned of this adverse effect. A short course of oral corticosteroids is indicated in moderate-to-severe cases of serum sickness.

Antivenom has been safely administered in pregnancy and during breastfeeding. Patients can be safely discharged after there is resolution of the clinical effects two hours after antivenom therapy, and admission for further treatment is rarely required.

There are case reports of the successful administration of red-back spider antivenom days to weeks after the bite. The use of antivenom in the period 24-96 hours after the bite appears justified based on the natural course of the envenoming and the frequent response in these cases.

### Steatoda species: cupboard, or button, spiders

*Steatoda* spiders belong to the same family as red-back spiders. In a recent study the clinical effects of *Steatoda* spider bite were similar to, but less severe than, those of red-back spider bites.<sup>6</sup>

Bites by these spiders may cause prolonged and radiating pain and non-specific systemic effects (table 4). In the most severe cases the effects are almost indistinguishable from those of red-back spider bite, except for the absence of local and regional diaphoresis. Some bites that are consistent with red-back spider bites but for which no spider has been collected may be severe cases of *Steatoda* bites.

Symptomatic treatment is the mainstay of treatment in *Steatoda* bites. In severe cases, IV red-back spider antivenom may be considered based on reports of its use in *Steatoda* bites and *in vitro* studies.

Spider bites from the genus *Achaearanea* (also from the same family as red-back spiders), cause prolonged pain similar to that of red-back spiders, but no systemic effects occur.

### Funnel-web spider bites

Funnel-web spiders (Hexathelidae, Atracinae families: *Atrax* and *Hadronyche* spp) are the most dangerous spiders in Australia. Although they occur widely throughout eastern Australia, severe envenoming has only been reported from southern Queensland to southern NSW. Even in parts of NSW where the spiders occur

commonly, bites are uncommon and severe envenoming rare.

Although only 5-10 severe envenomings require antivenom in Australia annually, it remains an important clinical condition because of its rapid onset, life-threatening effects and the availability of effective antivenom.

Local effects of funnel-web spider bites include puncture marks and local bleeding. Local pain is often severe and may last for 1-4 hours. Redness and swelling are less common. When these are the only reactions, the condition is often referred to as a dry bite. Severe envenoming develops in only a proportion of cases and is characterised by:

- Massive autonomic stimulation/excitation (both sympathetic and parasympathetic) with generalised diaphoresis, hypersalivation, lacrimation, piloerection, hypertension, bradycardia or tachycardia, and miosis or mydriasis.
- Neuromuscular excitation: paraesthesia (local, distal and oral), fasciculations (local or generalised, commonly tongue fasciculations) and muscle spasms.
- Non-specific systemic effects: nausea, vomiting, abdominal pain and headache.
- Non-cardiogenic pulmonary oedema and, less commonly, myocardial injury.
- Central nervous effects: agitation/anxiety, drowsiness and coma (CNS depression appears to be more common in children).

Other effects, including neuromuscular paralysis, intractable hypotension, secondary coagulopathy and multi-organ failure, were reported before the introduction of antivenom.

In a proportion of cases less severe envenoming occurs, with local neurotoxicity (paraesthesia, numbness or fasciculations), non-specific systemic effects or limited systemic envenoming.

Severe envenoming has been reported in bites from only six species of funnel-web confined to NSW and southern Queensland, including the Sydney funnel-web (*Atrax robustus*), the southern tree funnel-web (*Hadronyche cerbera*) and northern tree funnel-web (*Hadronyche formidabilis*). Only local effects and less severe envenoming have been reported for most other species.

An important part of the management of funnel-web spider bite is initial first aid and transport of the patient to an emergency department or local hospital. The mainstay of treatment in hospital is funnel-web spider antivenom, admission to a critical care area and monitoring for 12-24 hours until all evidence of envenoming has resolved. Atropine may be used for con-

trol of excessive secretions.

Funnel-web spider antivenom is a rabbit-derived IgG antivenom that appears to reverse envenoming effectively after bites from *Atrax* and *Hadronyche* spp. Premedication is not recommended and early allergic reactions and serum sickness are rare.

The initial dose of antivenom should be two ampoules (250 units) intravenously, which can be repeated until the features of envenoming have resolved.

Patients bitten by funnel-web spiders without symptoms of severe envenoming, or bites by unidentified big black spiders in eastern Australia, should initially be treated as suspected funnel-web spider envenoming.

The patient should have a pressure immobilisation bandage applied, be transported rapidly to hospital and observed in an emergency department for 2-4 hours. The pressure immobilisation bandage can be removed when the antivenom is available.

If there is no evidence of severe envenoming after two hours, it is unlikely to occur, but it is prudent to observe the patient for four hours in total.

#### Mouse spider bites

Mouse spiders (*Missulena* spp) are similar in appearance to funnel-web spiders and occur throughout mainland Australia. Suspected mouse spider bites should be treated as funnel-web spider bites in eastern Australia because these spiders are easily mistaken for funnel-web spiders.

A systematic review of mouse spider bites found that severe envenoming from these spiders was rare, with only one case out of 40 definite mouse spider bites.<sup>7</sup> Mouse spider bites cause mainly local effects (pain and fang marks), but local neurotoxic effects (paraesthesia) and non-specific systemic effects occur in some cases.

#### Other common spiders that cause minimal effects

##### Huntsman spiders

Huntsman spiders (family Sparassidae) are large spiders that are often feared by people because of their size and ability to climb walls. They are the most common spider to cause bites in Australia but only cause minor effects consistent with the mechanical effects of their large fangs (table 4).

Most bites, which commonly follow interference with the spider, occur on distal limbs and cause immediate and transient pain and puncture marks or bleeding in more than half of cases. Systemic effects are rare. Features consistent with local infection are reported more commonly (2.3% of cases) than with any other group of spiders. There are no major differences in

#### Details for expert spider identification

To obtain expert identification of a spider that has bitten a patient, send the spider in a specimen collection jar (in a small amount of 70-100% ethanol) with a short summary of the clinical details, and your contact details, to:

Dr Geoff Isbister,  
Newcastle Mater Hospital  
Edith St, Waratah,  
NSW 2298

\*Obtain permission from the patient for unidentified clinical details to be provided to Dr Isbister

#### Summary — suspected and definite spider bite

- In cases of suspected spider bite, the history of a bite should be confirmed and should only be considered a definite bite if a spider was seen and there are immediate clinical effects.
- Most spider bites cause minimal or no effects, including bites by huntsman spiders, orb-weaving spiders, wolf spiders, black house spiders and white-tail spiders.
- Significant morbidity is restricted to a few groups, including red-back spiders (and related spiders) and funnel-web spiders in Australia.
- Necrotic ulcers are highly unlikely to result from spider bites, and comprehensive investigation is required to identify the cause in suspected cases presenting with skin lesions or ulcers.
- The initial clinical effects and circumstances of spider bites can help with rapid discrimination of potentially medically important spider bites.
- A diagnostic algorithm can be used to discriminate big black spiders (including funnel-web spiders), red-back spiders and all other spiders.
- Suspected funnel-web spider bites should be observed and managed in hospital.
- Patients with red-back spider bites should be warned that prolonged pain may occur. In a significant proportion of cases, antivenom should be considered.
- For medical advice on envenoming contact the Poisons Information Centre (13 11 26).

Eastern mouse spider  
(Courtesy of Monash  
Venom Group).



Garden orb-weaving spider,  
one of the most common  
causes of spider bites in  
Australia.



effects of bites between different species of huntsman spiders.

##### Orb-weaving spiders

Orb-weaving spiders, which belong to the family Araneidae, cause a significant number of bites, but most are from garden orb weavers (*Eriophora* spp). Bites by these nocturnal spiders often occur when clothes dried on the washing line, typically overnight, are put on.

Bites cause minor effects, including transient pain, associated with localised redness. Bites from banded orb weavers and golden orb weavers are rare in Australia but appear to cause only minor effects.

##### Tarantulas

Theraphosid spiders (Tarantu-

las) are the largest of the mygalomorph spiders. They occur in all parts of the world and are being increasingly kept as pets. Bites from these spiders, although potentially lethal to some domestic animals, appear to cause little effect in humans, based on a series of bites by Australian theraphosids (Whistling spiders).

Local pain was the most common effect, usually associated with puncture marks and bleeding. Bites in dogs were far more severe, with death occurring in all seven reported cases.

##### Trapdoor spiders

Trapdoor spiders occur throughout Australia. Those from the family Idiopidae are similar in appearance to

funnel-webs and some species have a similar distribution to that of funnel-webs.

The Sydney brown trapdoor spider (*Misgolas rapax*) is often confused with the Sydney funnel-web spider. Although the circumstances (outdoors and gardening) and initial local effects (distal painful bites, often with fang marks) are similar to those of funnel-web bites, trapdoor spider bites cause only minor effects and should be managed as funnel-web bites until there is no evidence of envenoming after 2-4 hours.

#### Spider injuries other than bites

In addition to bites, injuries have been reported from contact with spiders, including

minor effects from leg spines and contact allergic reactions of the skin and eye. Injuries from the front leg spines cause pain at the time of contact with the spider, often mistaken for a bite, but distinguished from bites by the presence of 'splinters' at the bite site.

In some cases this can lead to local inflammation that may persist for several days. Hairs of South American theraphosid spiders (tarantulas) can cause urticarial skin reactions and ocular injuries. This may become an increasing problem in Australia, with these creatures becoming popular pets.

Conjunctival inflammation from the contents of squashed spiders entering the eye has been reported. This can be from either small spiders, such as daddy-long-legs, being rubbed in the eyes, or large spiders being hit with objects and the contents of the spider being projected into the eye.

This causes transient but severe conjunctival inflammation characterised by redness, oedema and significant pain. Treatment is by irrigation of the eye and analgesia. The effects resolve within 24 hours.

#### Spider bites in children

Although a subgroup analysis of the study demonstrated that most effects of spider bites in children are minor compared with those seen in adults, the analysis did not include enough cases of red-back or funnel-web spider bites to confirm or deny this conclusion in these groups of spiders.<sup>8</sup>

Theoretically red-back and funnel-web spider envenoming will be more severe in children because they are exposed to the same injected dose of venom as adults, so the dose per body weight is higher in children. It is therefore appropriate to assume that red-back spiders may cause significant effects in children.

This conclusion is consistent with recent research in children that showed that systemic and severe effects occurred in 85% of children, 65% having all three signs of diaphoresis, hypertension and irritability,<sup>9</sup> in contrast with only 22% in earlier research.

However both studies were retrospective and only included patients admitted to hospital, with widely varying rates of antivenom use. The dose of antivenom for red-back spider bites (and funnel-web spider envenoming) is the same in children as adults because it based on the dose of venom injected by the spider and not the weight of the child.

A clinical toxicologist can be contacted for advice on severe envenoming through the Poisons Information Centre (13 11 26) 24 hours a day.

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7. Isbister GK. Mouse spider bites (*Missulena* spp.) and their medical importance: a systematic review. *MJA* 2004; 180(5):225-27.
8. Isbister GK. A prospective cohort study of definite spider bites in Australian children. *Journal of Paediatrics and Child Health* 2004; 40:360-364.
9. Trethewey CE, Bolisetty S, Wheaton G. Red-back spider envenomation in children in Central Australia. *Emergency Medicine* 2003; 15:170-75.

#### Online resources

Clinical toxicology network web site:  
[www.toxinology.net](http://www.toxinology.net)  
'Toxinz' poisons management database:  
[www.toxinz.com](http://www.toxinz.com)

Author's case studies

**Increasing and persistent pain after putting on shoes**

A 46-YEAR-old man presents with pain in his right leg and abdomen. He says the pain started about 15-30 minutes after he put his shoes on this morning (seven hours ago).

Initially he had increasing pain in his right toe, which radiated to his knee and groin. He is now in considerable distress from the pain. On examination there is no obvious mark on his foot. He has bilateral below-knee diaphoresis.

**Questions**

1. What is the most likely diagnosis?
2. What is the appropriate treatment for this man?
3. In the emergency department he is administered two ampoules of antivenom IM two hours apart, but has ongoing pain and has developed malaise. What further management should be considered?

**Answers**

1. Red-back spider bite.
2. Referral to the local hospital or emergency department for antivenom.

3. After the failure of two ampoules of IM antivenom, IV antivenom should be seriously considered in a patient with significant ongoing symptoms. This can be discussed with a clinical toxicologist and the patient. Antivenom should be administered diluted in about 200mL of normal saline over 20-30 minutes.

**Identified big black spider bite**

You are called by a distressed mother who has found her three-year-old son crying with a black spider in his hand. He has bleeding puncture marks on

his index finger and complains of pain in his hand.

**Questions**

1. What is the appropriate advice for this mother?
2. What symptoms and signs would you look for in the child once they arrive in hospital?
3. In a child with dyspnoea, generalised diaphoresis, drowsiness and hypertension, what is the appropriate treatment?

**Answers**

1. The mother should be advised to

immobilise the child and apply a firm bandage to the hand and arm with a 10-15cm crepe bandage. She should call for an ambulance for immediate transport to hospital.

2. Features of funnel-web spider envenoming, including autonomic features (diaphoresis, salivation, lacrymation, miosis or mydriasis), neuro-excitation (paraesthesia, fasciculations and muscle spasm), pulmonary oedema, hypertension and drowsiness or irritability.
3. Antivenom (two ampoules IV) and admission or retrieval to a critical care area.

GP's contribution



DR MARICA MANNING, GREENWICH, NSW

**Case study**

IN the summer of 1981 I was a senior resident in the casualty department of Ryde Hospital in Sydney, on an evening shift, when a middle-aged man walked — or rather limped — in, saying he'd just been bitten by a funnel-web spider.

He'd been changing a light globe in his lounge room and had stepped down onto the spider. He had cried out to his neighbour, who came quickly and applied a pressure bandage to his foot and lower leg. It took a few minutes for the neighbour to drive him up to the hospital. The spider was not caught.

Initially our staff seemed to doubt it was a significant funnel-web bite because the patient looked well. We asked him to sit up on the bed in the emergency room, which he did, but almost immediately he became severely unwell. He vomited the huge meal he'd recently consumed, started sweating profusely and began coughing up white foam. He had a huge tachycardia and a systolic blood pressure of more than 200mmHg. Within a few minutes of arriving he appeared to be drowning in his own secretions. His bandage was left undisturbed.

In those days, Ryde had

only one registrar present in the hospital at night. It was a rotation of medical, surgical, orthopaedic and anaesthetics registrars. The patient who had been bitten by the funnel-web was fortunate that night because the anaesthetics registrar was on duty. It was a difficult intubation but it was achieved and the patient given alcuronium, valium, lasix and some narcotic.

I was given the task of hand-ventilating him in the ambulance taking him to Sydney's Royal North Shore Hospital, where he was able to receive the first ever dose

of funnel-web antivenom. I think he needed either one or two further doses, but was able to walk out of Royal North Shore within 48 hours.

**Questions for the author**  
Can you cite the statistics on the use on funnel-web antivenom around Sydney in recent years.

There are 1-10 cases (median, 5) of funnel-web spider bites requiring antivenom annually, and 0-3 of these in the Sydney region.

**Is the appearance of pulmonary oedema usual after these bites?**

Pulmonary oedema occurs in about 40-70% of severe funnel-web spider envenomings, and is more common in children.

**How much time usually elapses before signs of envenomation appear, and how effective is the pressure bandage?**

Signs of envenomation will develop within two hours, and usually within the first 30 minutes. Pressure immobilisation appears to slow envenomation (based on case reports and animal studies) and so is the recommended first aid.

Australian Doctor

How To Treat CPD

Australian Doctor Education

**Instructions**

Earn 2 CPD points by completing this quiz online or on the attached card. Mark your answers on the card and drop in the post (no stamp required) or fax to (02) 9422 2844. For immediate feedback click the 'Earn CPD pts' link at [www.australiandoctor.com.au](http://www.australiandoctor.com.au) Note that some questions have more than one correct answer. The mark required for CPD points is 80%. Your CPD activity will be updated on your RACGP records every January, April, July and October.

**1. Which symptom/sign is always present with a spider bite (choose ONE)?**

- a) Fang marks
- b) Erythema
- c) Pain or discomfort at the bite site
- d) Swelling and oedema

**2. When a person has seen a spider biting but was unable to collect or describe it, which ONE question is least likely to be helpful in evaluating the significance of the bite?**

- a) Is there local diaphoresis?
- b) When did the bite occur (month of year, time of day)?
- c) In which state/territory did the bite occur?
- d) Is there blanching of the skin adjacent to the spider bite?

**3. Craig, 55, felt a bite and pain while putting on his gardening gloves and retrieved a red-back spider. He has local pain, but is not distressed and has no other signs. He**

**attends your surgery, with the spider. What advice would you be most likely to give him (choose TWO)?**

- a) Craig can be managed at home with instructions to attend the hospital if pain increases or if he develops systemic side effects
- b) Red-back spider antivenom should be administered IM immediately at the closest hospital
- c) Analgesia is very effective in red-back spider bites
- d) Craig should be advised that the pain may last 1-4 days

**4. If Craig had not retrieved the spider, what THREE clinical features would alert you that this is a possible red-back spider bite?**

- a) The presence of bleeding at the site of the bite
- b) The character of the pain
- c) The circumstances of the bite
- d) The presence of local or regional diaphoresis

**5. Craig attends the hospital two hours later with severe pain, headache and malaise. He is given one ampoule of red-back spider antivenom IM, with resolution of his symptoms. Which TWO statements about red-back spider antivenom are correct?**

- a) The dose for children is the same as for adults
- b) Serum sickness may occur
- c) The red-back spider antivenom can only be used IM, as per the manufacturer's recommendation
- d) Antivenom is unsafe in pregnancy and breastfeeding

**6. Carol presents with a necrotic ulcer on her lower leg. Which is the least likely cause of the ulcer?**

- a) Cutaneous neoplasia
- b) White-tail spider bite
- c) Peripheral arterial disease/vasculitis
- d) Infection

**7. Bob, who lives in NSW, has been bitten on the lower leg by a large black spider, which he flicked off when he felt the pain. There are fang marks. He phones you for advice. Which advice is correct (choose TWO)?**

- a) Bob should remain as immobile as possible until transported to hospital
- b) A pressure immobilisation bandage should be applied and immediately removed on arrival at hospital

- c) Rapid transport to hospital for observation is necessary
- d) Funnel-web spider antivenom should be administered IV on arrival at hospital

**8. Concerning the consequences of funnel-web spider bite, which ONE statement is incorrect?**

- a) Tongue fasciculation may occur
- b) The pain usually lasts for 24 hours
- c) Anxiety and drowsiness may occur
- d) Generalised diaphoresis often occurs

**9. In the emergency department Bob develops hypertension, tachycardia, hypersalivation and paraesthesia adjacent to the bite. Which ONE statement concerning his management is correct?**

- a) Funnel-web spider antivenom should be given once only, IV
- b) Premedication is necessary before administration of funnel-web spider antivenom because allergic reactions are common
- c) Serum sickness commonly occurs after administration of funnel-web spider antivenom
- d) Atropine may be warranted in Craig's management

**10. Which ONE of the following spider bites is most likely to cause significant effects?**

- a) Tarantulas (Theraphosid spiders)
- b) Mouse spiders
- c) Huntsman spiders
- d) Orb-weaving spiders

**HOW TO TREAT**

Editor: Dr Lynn Buglar  
Co-ordinator: Julian McAllan

**NEXT WEEK**

The next How to Treat discusses various aspects of palliative care. The author, Professor Linda Kristjanson, is The Cancer Council of WA professor of palliative care, school of nursing and public health, Edith Cowan University, Churchlands, WA.

Figure 1: Decision tree for predicting types of spider bites (also available online at [australiandoctor.com.au](http://australiandoctor.com.au) in the How to Treat section of our web site).

