

Insect bites and stings: antimicrobial prescribing

NICE guideline

Draft for consultation, November 2019

This guideline sets out an antimicrobial prescribing strategy for insect bites and stings. It aims to optimise antibiotic use and reduce antibiotic resistance.

The recommendations in this guideline are for managing insect and spider bites and stings in adults, young people and children aged 72 hours and over. It does not cover diagnosis, treatment of infections transmitted by insects (such as malaria and Lyme disease) or treatment of infestations (such as the removal of headlice, bed bugs or fleas).

For newborn babies under 72 hours, seek specialist advice.

For managing other skin and soft tissue infections see our web pages on [wound management](#) and [infections](#). We have also produced related antimicrobial prescribing guidance on [cellulitis and erysipelas](#) and [human and animal bites](#).

See a 1-page visual summary of the recommendations.

Who is it for?

- Healthcare professionals
- People with insect bites and stings, their families and carers

The guideline contains:

- the draft recommendations
- the rationales
- summary of the evidence.

Information about how the guideline was developed is on the [guideline's page](#) on the NICE website. This includes the full evidence review, details of the committee and any declarations of interest.

1 Recommendations

2 **1.1 *Managing insect bites and stings***

3 **Assessment and advice**

4 1.1.1 Assess the type and severity of the [insect bite or sting](#) to identify:

- 5 • a local inflammatory or allergic skin reaction
- 6 • symptoms or signs of an infection
- 7 • a systemic reaction (see the recommendations on [referral and seeking](#)
- 8 [specialist advice](#)).

9 1.1.2 Be aware that a rapid-onset skin reaction from an insect bite or sting is
10 likely to be an inflammatory or allergic reaction, rather than an infection.

11 1.1.3 Advise people with an insect bite or sting that:

- 12 • skin redness and itching are common and may last for up to 10 days
- 13 • it is unlikely that the skin will become infected
- 14 • avoiding scratching may reduce inflammation and the risk of infection
- 15 • a community pharmacist can advise about self-care treatments
- 16 • they should seek medical help if symptoms worsen rapidly or
- 17 significantly at any time, or they become systemically unwell.

18 1.1.4 Follow the [NICE guideline on Lyme disease](#) for people with a tick bite.

To find out why the committee made the recommendations on assessing insect bites and stings see the [rationales](#).

1 **Treating a local inflammatory or allergic skin reaction**

2 1.1.5 Do not offer an antibiotic for people with an insect bite or sting who do not
3 have symptoms or signs of an infection.

4 1.1.6 Be aware that people may wish to consider an oral antihistamine (in
5 people aged over 1 year) to help relieve itching, although there is
6 uncertainty about their effectiveness in managing insect bites or stings.
7 Some antihistamines cause sedation, which may help at night.

8 **Treating an infected insect bite or sting**

9 1.1.7 For people who have symptoms or signs of an infected insect bite or sting,
10 see the [recommendations on choice of antibiotic in the NICE guideline on](#)
11 [cellulitis and erysipelas](#).

To find out why the committee made the recommendations on treating
insect bites and stings see the [rationales](#).

12 **Reassessment**

13 1.1.8 Reassess people with an insect bite or sting if:

- 14
- 15 • symptoms or signs of an infection develop (see the [NICE guideline on](#)
[cellulitis and erysipelas](#))
 - 16 • the person's condition worsens rapidly or significantly, or they become
17 systemically unwell.

18 1.1.9 When reassessing people with an insect bite or sting, take account of
19 other possible diagnoses such as Lyme disease (see the [NICE guideline](#)
20 [on Lyme disease](#)).

21 **Referral and seeking specialist advice**

22 1.1.10 Refer people with an insect bite or sting to hospital if they have symptoms
23 or signs suggesting a more serious illness or condition, such as a
24 systemic allergic reaction (see the [NICE guideline on anaphylaxis](#)).

1 1.1.11 Consider referral or seeking specialist advice for people with an insect bite
2 or sting if:

- 3 • they are systemically unwell
- 4 • they have had a previous systemic allergic reaction to the same type of
5 bite or sting
- 6 • the bite or sting is in the mouth or throat, or around the eyes
- 7 • it has been caused by an unusual or exotic insect
- 8 • they have fever associated with a bite or sting that occurred while
9 travelling outside the UK.

To find out why the committee made the recommendations on referral and specialist advice for insect bites and stings see the [rationales](#).

10 **Terms used in the guideline**

11 **Insect bite or sting**

12 For the purpose of this guideline, 'insect bites' also includes bites from spiders and
13 ticks. Insects may bite with their mouthparts when feeding or defending themselves.
14 Stings come from bees, wasps and hornets and are used only for defence.

15 **Rationales**

16 The recommendations in this guideline are based on the evidence identified and the
17 experience of the committee.

18 **Assessment**

19 **Why the committee made the recommendations**

20 [Recommendations 1.1.1 to 1.1.4](#)

21 Most insect bites and stings can be treated at home with simple first aid, with advice
22 from a community pharmacist. Prescribers are unlikely to be involved, even in the
23 few cases when symptoms may last for up to 10 days, because secondary bacterial
24 infection is rare. The committee agreed that in most cases, knowing what caused the

1 bite or sting is unlikely to change how it is treated. The committee also noted that
2 redness, itchiness or pain and swelling after an insect bite or sting is much more
3 likely to be an inflammatory or allergic reaction, rather than an infection. The
4 committee noted that the extent of redness from an insect bite or sting may be less
5 visible on darker skin tones, and health care professionals should take this into
6 account when assessing insect bites.

7 [Return to the recommendations.](#)

8 ***Treatment***

9 **Why the committee made the recommendations**

10 [Recommendations 1.1.5 to 1.1.7](#)

11 Although biting insects can carry bacteria on their mouthparts, most infected bites
12 are likely to be secondary bacterial infections that arise from scratching the bite
13 lesion. Symptoms and signs of infection most likely indicate cellulitis and should be
14 treated with antibiotics in line with the [NICE guideline on cellulitis and erysipelas](#).

15 There is limited evidence with high uncertainty for the use of oral antihistamines in
16 reducing lesion size and itchiness from mosquito bites. However, based on their
17 experience, the committee agreed that oral antihistamines may help to relieve
18 itching. Although the included study of oral antihistamines compared with placebo
19 included only children aged 2 years and over, the committee acknowledged that oral
20 antihistamines are also an option for adults and younger children. Not all
21 antihistamines are licensed for treating insect bites and stings, and not all
22 antihistamines are licensed in young children. The committee also discussed the use
23 of sedating antihistamines in children, noting that the [BNF for Children](#) states:
24 ‘Sedating antihistamines are occasionally useful when insomnia is associated with
25 urticaria and pruritus.’

26 No evidence was found for other self-care treatments (such as topical
27 corticosteroids, topical antihistamines and analgesics), but studies published before
28 2000 that compared these treatments were not included in the literature search.
29 However, the lack of evidence does not necessarily mean that they are ineffective;
30 many of these interventions are often used in practice. Given the range of potential

1 self-care treatments and differences in licensed indications, the committee
2 concluded that a community pharmacist is ideally placed to advise people about
3 managing an insect bite or sting at home.

4 For more detail see the summary of the evidence on [antihistamines in adults and](#)
5 [children](#).

6 [Return to the recommendations](#).

7 ***Referral or seeking specialist advice***

8 **Why the committee made the recommendations**

9 [Recommendations 1.1.10 to 1.1.11](#)

10 Insect bites and stings are the second most common cause of serious allergic
11 reactions, so the committee agreed that people with symptoms or signs of a serious
12 allergic reaction should be referred for urgent care.

13 It is also important to consider referral or seeking specialist advice in the following
14 situations:

- 15 • people who have had a previous systemic allergic reaction to the same type of
16 bite or sting, or the bite or sting is in the mouth or throat, or around the eyes,
17 because a serious allergic reaction is more likely
- 18 • people with a bite or stings from an unusual or exotic insect or spider, because
19 management may be different. For example, certain spider bites can lead to tissue
20 necrosis
- 21 • people with fever following an insect bite or sting from outside the UK, because
22 this may indicate a more serious illness such as malaria.

23 [Return to the recommendations](#).

24 **Context**

25 An insect bite or sting often causes a small, red lump on the skin, which may be
26 painful and itchy. Infection is unlikely, but it is unclear which organisms cause
27 secondary bacterial infections.

1 **Summary of the evidence**

2 This is a summary of the evidence, for full details see the [evidence review](#).

3 The evidence included:

- 4 • 1 randomised controlled trial in adults with extensive cellulitis caused by an
5 arthropod bite ([Friedland et al. 2012](#))
- 6 • 1 systematic review of double-blind, crossover randomised controlled trials of oral
7 antihistamines in people with uninfected mosquito bites ([Foex et al. 2006](#))
- 8 • 2 double-blind, crossover randomised controlled trials of oral antihistamines in
9 people with uninfected mosquito bites ([Karpinnen et al. 2006](#) and [Karpinnen et al.](#)
10 [2012](#))
- 11 • 1 retrospective study ([Dyachenko and Rozenman 2006](#)) of treatments in people
12 with an uninfected bite (confirmed or presumed to be caused by a brown recluse
13 spider).

14 Randomised controlled trial evidence was only identified for the effectiveness of oral
15 antihistamines in adults and children with mosquito bites and for intravenous
16 antibiotics in adults with an infected arthropod (of undefined species) bite. Only 1 of
17 the randomised controlled trials included people with a secondary infection of their
18 bite and this was a subgroup of people with an infected arthropod bite from a larger
19 trial.

20 No evidence was identified for antibiotics in children and young people.

21 ***Antibiotics for infected arthropod bites in adults***

22 Based on clinical response at day 3, there was no difference in the clinical
23 effectiveness of intravenous (IV) ceftaroline compared with IV vancomycin plus IV
24 aztreonam (Friedland et al. 2012) in adults with extensive cellulitis caused by an
25 arthropod bite. No adverse effect data were reported.

1 ***Oral antihistamines for uninfected mosquito bites in adults***

2 **Cetirizine 10 mg once or twice daily compared with placebo**

3 There was no significant difference in median mosquito bite lesion size at 10
4 minutes, 60 minutes, 12 hours or 24 hours with cetirizine compared with placebo. In
5 2 studies there was a significant difference in median mosquito bite lesion size at 15
6 minutes compared with placebo (but no difference was seen in a third study).

7 There was no significant difference in pruritus after mosquito bite exposure at 10
8 minutes, 30 minutes, 90 minutes, 24 hours, 48 hours, 5 days or 7 to 10 days with
9 cetirizine compared with placebo. However, there was a significant reduction in
10 mean or median pruritus scores at other timepoints: 15 minutes, 60 minutes, 12
11 hours, and at days 3, 4 and 6.

12 There was no significant difference in adverse effects (mild to severe sedation,
13 headache, emesis or arthralgia) at follow-up.

14 In 1 study, 7 of 9 people preferred cetirizine 10 mg twice daily (1 preferred placebo
15 and the other had no preference).

16 **Levocetirizine 5 mg once daily compared with placebo**

17 There was a significant reduction in both median mosquito bite lesion size and
18 median pruritus scores at 15 minutes, and in delayed bite lesions at 24 hours.

19 There was no significant difference in adverse effects (mild to moderate
20 somnolence) at follow-up.

21 **Loratadine 10 mg once daily compared with placebo**

22 There was no significant difference in median mosquito bite lesion size or median
23 pruritus scores at 15 minutes.

24 There was no significant difference in adverse effects (mild to moderate sedation) at
25 follow-up.

1 **Rupatadine 10 mg once daily compared with placebo**

2 There was a significant difference in median mosquito bite lesion size at 15 minutes,
3 but no significant difference in delayed bite lesion size at 24 hours.

4 There was a significant reduction in median pruritus scores at 15 minutes but no
5 difference for delayed bite reaction pruritis at 24 hours.

6 Adverse effects (sedation) were significantly increased at follow-up.

7 ***Antihistamines for uninfected mosquito bites in children***

8 **Loratadine 0.3 mg/kg once daily compared with placebo**

9 There was a significant reduction in median bite lesion size at 15 minutes and 24
10 hours but no significant difference at 2 and 6 hours. There was also a significant
11 reduction in median pruritus score at 15 minutes.

12 There was no significant difference in adverse effects (mild gastrointestinal pain and
13 diarrhoea) at follow-up.

14 ***Treatments for uninfected brown recluse spider bites***

15 A single-centre retrospective study (Dyachenko and Rozenman 2006) reported data
16 for 52 people with an uninfected bite which was confirmed or presumed to be caused
17 by a brown recluse spider. The study included people aged 9 to 66 years, but results
18 were not broken down by age.

19 All patients had prophylactic antibiotics (92.3% had cefalexin; no further details
20 given), rest, cold compression and elevation. Most patients (92.3%) had
21 prednisolone and an antihistamine (no further details given), and 21 patients (40.4%)
22 had a non-steroidal anti-inflammatory drug. All the outcomes were assessed as
23 being very low quality.

24 The authors concluded that none of the treatments prevented necrotic lesions, and
25 their role in time to healing and length of hospital stay was unclear.

26 See the [evidence review](#) for more information.

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