Insect bites or stings

Remove the stinger or insect from the person to prevent the further spread of venom or disease.

Insect bites and stings can transmit diseases (such as malaria, encephalitis or Lyme disease) and can cause wounds that can become infected. Certain insect bites can also cause an Allergic reaction in people, even if they have been bitten before.

Guidelines

- A bee’s stinger should be removed as soon as possible. *
- If a commercial tick removal device is available, a tick may be removed with the device according to the manufacturer’s instructions. *
- The following tick-removal methods must be avoided: using gasoline, petroleum or other solvents to suffocate the tick, and burning the tick with a match. *

Good practice points

- If no commercial tick removal device is available, the first aid provider may grab a tick as close to the skin as possible with very fine forceps or tweezers and pull it gradually and firmly out of the skin.
- The stinger apparatus may be removed by grasping and pulling the apparatus versus scraping it out.
- The bitten or stung area should be thoroughly cleaned with potable (clean) water and then an antiseptic solution. If no clean water is available, use an antiseptic solution.
- In the case of a bite or sting to the throat or mouth, the first aid provider should immediately access EMS and apply ice to the affected area to reduce any swelling which may affect the person’s airway.
- First aid providers should monitor the person for signs of an Allergic reaction or anaphylaxis and provide the appropriate care.
• The person should avoid scratching the bite as this can cause an infection, especially if the fingernails are dirty.
• The skin may become redder, purple, or darker, as well as warm and painful at the site of an insect bite or sting. This should improve over a day or two. However, if it gets progressively worse, the person should seek medical advice as this could be a sign of infection. Antibiotics or vaccinations may be needed.
• Travelers should check to see what insect-related risks are prevalent in the area they are travelling to and seek medical advice. They may need vaccinations or medication before leaving home.

Guideline classifications explained

Chain of survival behaviours

Prevent and prepare

• To prevent diseases caused by insects, such as malaria and Lyme disease, use insect repellent and promptly remove any ticks.
• Consult local authorities for information on landscaping and pest management to support any locally recommended behaviour or places to avoid in order to reduce risk.
• In some countries, in accordance with local regulations, report any tick bites to authorities. Some authorities request that you send the biting tick or ticks for identification and testing.

In first aid education, explore the following information with learners on avoiding bites and the behaviours to adopt during an insect attack:

• Keep away from flowering plants, ripe fruit bushes and trees, rotten fruit, compost and food waste. If this is not possible, wear long trousers and long-sleeved clothes and cover your hands and face.
• Wear shoes when walking outside, particularly on grass or flowering ground.
• When outside, cover your drinks and food and check them before drinking or eating.
• Wipe off any food from the clothes, hands and faces of children as this may
Attract bees or wasps.
- Before moving objects with your hands (such as containers that have been left outside), check underneath and inside them for insects that may bite or sting.
- Shake out shoes, socks and clothing before putting them on as they might contain insects.
- Do not touch or disturb bee or wasp hives. If you want to harvest honey, protect yourself by wearing long trousers and long-sleeved clothes and cover your hands and face as much as possible.
- Remain calm if attacked by a bee or wasp. Do not wave your hands in an attempt to brush them away, since they react to movement.
- Run and find shelter if attacked by a swarm.

Early recognition

A tick bite is not painful and is often not detected, or only discovered by accident. Initially, a tick is only a pinhead in size, making it difficult to spot. An engorged tick is about the size of a small pea. After a few hours, the bite may start to itch.

A person who is bitten or stung by an insect may experience:

- initial sharp pain
- swelling, itching or a rash at the site of the bite or sting.

The person may develop a mild or severe Allergic reaction following an insect bite or sting.

Observe the person closely for any development of an allergic reaction. A rash can be more difficult to see on black or brown skin (Nolen, 2020). Checking lighter areas of skin such as the palms of hands or soles of feet may help you to see it.

First aid steps

Tick bite

1. Reassure the person and remove the tick as quickly as you can. Use a manufactured tick removal device to remove the tick according to the manufacturer’s instructions. If a manufactured device is not available, use fine forceps or tweezers to grab the tick as close to the skin as possible and pull it...
gradually and firmly out of the skin.
2. Wash the site of the bite with water and then disinfect it with an antiseptic solution.
3. Write down the date and the area where the person was bitten in order to monitor the area around the bite.
4. Seek medical advice if there is concern about an infection (fever, inexplicable fatigue, or joint pain) or if a rash appears. The Lyme disease rash is a circular rash that appears as a patch surrounded by a ring.

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CAUTION

• Do not squeeze the body of the tick, as this may trigger the release of the disease-causing bacteria onto the skin.
• Do not use chemicals or heat to numb or kill the tick.

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Other insect bite or sting

1. Reassure the person and advise them not to scratch, as this may aggravate the injury.
2. If the stinger is still in the person, remove it as quickly as possible, by grasping and pulling the stinger.
3. Thoroughly clean the site of the bite or sting with water. If no clean water is available, use an antiseptic solution.
4. Cool the stung area with ice cubes in a bag of water or a cooling bag to limit swelling, itching and pain. If the sting was on the hand, remove the rings.

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CAUTION

When removing the stinger avoid your fingers, or any other object that can pierce
or press down on the venom bag, as this will aggravate the symptoms.

Access help

- Access EMS immediately if:
  > The person is bitten or stung in the mouth or on the throat, as it can be dangerous as any swelling could block their airway. While waiting for medical care, try to cool the injured area with ice (for example, by letting the person suck on an ice cube) to reduce swelling.
  > The person shows any signs of a severe allergic reaction.

- Access medical care if:
  > You can’t get the stinger out.
  > The person develops a painful itchy swelling or a rash.
  > The person feels progressively worse after being bitten or stung (this can occur up to 24 hours after the bite or sting).
  > The person was bitten or stung many times.
  > The person suspects they are not sufficiently protected from tetanus.

Recovery

Monitor for signs of infection. The skin may become red, purple, or darker, as well as warm and painful at the site of an insect bite or sting. This should improve over the course of a day or two. However, if it gets progressively worse, the person should seek medical advice as this could be a sign of infection.

Education considerations

Context considerations

- Programme designers should consult local medical centres to find out which
insect-related diseases are common in the area and what preventative measures to take. These measures may include:

> using repellent or a bed net
> taking medication for malaria prevention
> getting vaccinated for tick-borne encephalitis
> wearing long sleeves and trousers (especially at dawn when insects are active).

- In Europe and North America, several species of Ixodes ticks are carriers for tick-borne infections. One major infection is Lyme disease. Typical symptoms include fever, headache, fatigue and a specific skin rash that is circular and appears as a ringed patch on different parts of the body. If left untreated, the infection can spread to the joints, heart and nervous system. Most cases of Lyme disease can be treated successfully with antibiotics.
- In Sub-Saharan Africa and South Asia, malaria is transmitted by the bite of a mosquito. A person with malaria is usually very sick with symptoms such as high temperatures, shivering with shaking and flu-like illness. Many effective medicines are available to prevent and treat malaria. Health professionals can advise you on how to take the medicine that is best for you.

**Learner considerations**

- In regions where Lyme disease is prevalent, all people are at equal risk of contracting it, though the visibility of skin rashes will vary according to skin colour (Fix et al., 2000). First aid education should emphasise rash recognition across all skin colours and describe other symptoms that may be present. Programme designers should actively look for opportunities to increase awareness of this topic in groups that are more likely to include learners who are black.
- While nearly half the world faces the risk of malaria, children under five years old are the most vulnerable group affected by it. Pregnant women, those with HIV or AIDS, and mobile populations (travellers) are also particularly at risk (WHO, 2020).
- Learners who are aware of family members, friends or colleagues who are allergic to insect bites and stings should be encouraged to familiarise themselves with what support that person might need.
Facilitation tips

- Ask learners to share experiences of being bitten or stung, including how it feels and how they responded to develop the group’s confidence to handle this type of injury.
- Demonstrate how to use a manufactured tick removal device or tweezers to effectively remove a tick and a bank card or the blunt side of a knife to remove a sting.

Facilitation tools

- Share photos of local insects and their associated injuries or infections to help learners identify them.
- Bring a variety of tick removal tools to show learners.

Learning connections

- Ensure learners are comfortable monitoring a person for signs of an Allergic reaction and anaphylaxis.
- Link this topic to the removal of stingers of marine and freshwater animals. (See Aquatic animal injuries.)
- Give time to practise giving emotional support and comfort to the injured person as a bite or sting can be very distressing.

Scientific foundation

The Centre for Evidence-Based Practice (CEBaP) conducted several evidence summaries on this topic, in 2019.

Ticks

Forceps

There is limited evidence from one non-randomised controlled trial neither in favour of pulling with forceps nor twisting with forceps to remove a tick. A
statistically significant decrease of ticks with damaged mouthparts or mouthparts that broke off, when pulling with forceps compared to twisting with forceps, could not be demonstrated. Evidence is of very low certainty and results of these studies are imprecise due to limited sample size, the low number of events and large variability of results.

**Commercial tick removal devices**

There is limited evidence from four studies in favour of using specialised commercial devices. Twisting devices (pen-tweezers, Tick Twister and “lasso” (Trix® tick remover)) resulted in a statistically significant decrease of severed tick mouthparts compared to pulling devices (Adson forceps or “card” (TickPic). It was shown that the use of a commercial device resulted in a statistically significant reduction in mouthpart damage of tick nymphs compared to the use of forceps. However, it was shown the commercial device did not result in a statistically significant reduction in damage to the mouthparts compared to using forceps for adult tick removal.

It was shown that pulling straight using forceps resulted in a statistically significant decrease in the number of nymphs and females with damage to mouthparts compared to rotation with the Tick solution. However, it was also shown that rotation with the Tick solution resulted in a statistically significant decrease in the percentage of mouthpart damage and in damaged nymphs and females compared to pulling straight using forceps.

Evidence is of very low certainty and the results of these studies are imprecise due to a lack of data, limited sample sizes, low number of events and large variability of results.

**Chemical treatments or heat followed by the mechanical removal**

There is limited evidence from two studies neither in favour of removing ticks using chemical treatments (including gasoline, methylated spirit, petroleum jelly and 70 %isopropyl alcohol), or heat (a lit kitchen match) nor of no treatment. A statistically significant decrease in damaged mouthparts could not be demonstrated. Evidence is of very low certainty and results of these studies are imprecise due to limited...
In addition, there is limited evidence from two studies neither in favour of using nail polish nor not using nail polish. It was shown that using nail polish resulted in a statistically significant decrease in damaged tick mouthparts after removal of the tick less than 72 hours after attachment, compared to not using nail polish. However, in a second study, a statistically significant decrease of the number of female ticks with damaged mouthparts after removal 12-15 hours or 72-96 hours after attachment using nail polish compared to not using nail polish could not be demonstrated. A statistically significant decrease in the number of tick nymphs with damaged mouthparts after removal less than 24 hours after attachment, using nail polish compared to not using nail polish, could not be demonstrated. The evidence is of very low certainty, and the results are imprecise due to the limited sample size, the low number of events and large variability of results.

**Bee stings**

With regards to bee stings, most people who get stung develop a raised, inflamed mark known as a weal. The CEBaP evidence summary revealed limited evidence from one randomised controlled trial in favour of quick removal of a bee sting. The trial showed a statistically significant decrease in the weal area after 10 minutes with a quick time of removal, compared to no quick removal. Evidence is of low certainty and the results of this study are imprecise due to limited sample size and lack of data.

**Insect bites and stings, suction, or household treatments**

No studies were found about cooling with ice, or on the use of suction, in case of an insect bite or sting.

Regarding household treatments (vinegar, baking soda, sugar etc.), there is limited evidence from one non-randomised controlled trial neither in favour of sugar nor a placebo bandage. A statistically significant increase or decrease of pain, swelling or itching, using a sugar bandage compared to a placebo bandage, could not be
demonstrated. Evidence is of low certainty and results of this study are imprecise due to the limited sample size and lack of data.

**Education review**

Commentary on medical education’s bias to use white skin as the standard for the recognition of illness has identified a similar bias in first aid education, particularly regarding this topic. Nolen (2020) referred to a paper on the recognition of Lyme Disease by Fix et al. (2000) that has informed our commentary for this section. The paper concluded that skin rashes caused by Lyme disease are under-recognised in African American populations (and by extension, people of colour). The article suggested a variety of reasons including:

- the rash is less visible
- less accessible care may make African Americans less likely to seek medical treatment
- healthcare professionals might be biased in their diagnosis, assuming African Americans are less likely to be infected with Lyme disease.

**References**


Education references


Allergic reaction and anaphylaxis
Aquatic animal injuries
Remote context
Explore the guidelines

Published: 15 February 2021

First aid

Explore the first aid recommendations for more than 50 common illnesses and injuries. You’ll also find techniques for first aid providers and educators on topics such as assessing the scene and good hand hygiene.
First aid education

Choose from a selection of some common first aid education contexts and modalities. There are also some education strategy essentials to provide the theory behind our education approach.
About the guidelines

Here you can find out about the process for developing these Guidelines, and access some tools to help you implement them locally.