



**American
Red Cross**

Scientific Advisory Council

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Advisory
Jellyfish Stings**

Overall Recommendation:

Following sting from a jellyfish in US coastal or territorial waters immediately observe for signs of shock or anaphylaxis. If either of these are present call 9-1-1. Remove any remaining tentacles by lifting or scraping them off with a blunt object, such as a sea shell or wash of the tentacles with sea water. If topical lidocaine gel is available it can be applied to inactive any of the remaining stinging cells that may be remaining on the skin and to start to relieve pain. The victim should then apply heat to the affected area, preferentially by hot water immersion/shower, in a range of 106-113°F, or practically as hot as the patient can tolerate without scalding them. If a tub for hot water immersion or a shower is not available, a chemical heat pack can be applied over the affected. Heat application should take place for a duration of up to 20 minutes or until pain is relieved. Cold packs were less beneficial than heat packs in relieving pain, but may offer some benefit with heat or lidocaine are not available. Vinegar (acetic acid) was confirmed to result in discharge of the stinging organelles of some species of jellyfish, and is, therefore, no longer recommended in the majority of jellyfish stings in US coastal waters. Salt water (compared to water, meat tenderizer, etc.) has not been found to cause nematocysts discharge and thus is recommended for rinsing a sting site prior to applying heat or hot water.

Recommendations and Strength (using table below):

Standards:

- Assess for loss of responsiveness, signs of shock or anaphylaxis and call 9-1-1 if present. Begin CPR as indicated.
- Following removal of remaining tentacles, use hot water immersion/irrigation or apply a hot pack to relieve pain. The temperature of the water or hot pack should be ~106-113° F or as hot as tolerated (not scalding), for 20 minutes or until pain is relieved.

Guidelines:

- Gently lift or scrape off any remaining tentacles with a blunt object, such as a sea shell, and/or rinsing the affected area with sea water.
- Vinegar (acetic acid) is not recommended for most jellyfish stings in US coastal waters.

Options:

- Topical lidocaine cream or gel may be of benefit for pain control
- If hot packs or hot water are not available, it is reasonable to apply a cold pack

Questions to be addressed:

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In adults and children who sustain a sting/envenomation from a jellyfish in coastal or territorial water of the United States, does the application of vinegar, baking soda, sea water, cold packs, heat, topical steroids or other preparations designed to treat jellyfish stings, compared to each other or to no intervention, reduce symptoms of pain, redness, or allergic reactions?

Introduction/Overview:

Stings from jellyfish are common, particularly during summer months when vacationers flock to beaches on the east and gulf coasts. The National Science Foundation estimates that about 500,000 people are annually stung by jellyfish in the Chesapeake Bay and about 200,000 people are annually stung by jellyfish in Florida. Stings are most common during summer months when beaches and coastal waters are invaded by vacationers. Fortunately, most stings from jellyfish in US waters only cause pain, with little risk for allergic reactions or death. Symptoms of envenomation in humans vary with the species but can range from a mild sting to agonizing pain and systemic symptoms. Anaphylaxis can occur.

Jellyfish are often clear or are submerged and not visible, thus, the type of jellyfish may not be readily identified, making species specific treatment recommendations difficult to implement. Therefore it is more practical to have treatment recommendations that provide benefit for the most common jellyfish in a region, while not inducing harm. In addition, first aid treatments for patients suffering from jellyfish sting sustained in US coastal waters have often been derived from data obtained on jellyfish that do not inhabit US water.

Previous first aid recommendations advocated for the use of a variety of agents including baking soda, meat tenderizer, or vinegar to wash the affected area of the sting. While these traditional agents, including vinegar, have been traditionally used as a treatment for a large variety of jellyfish stings, there is evidence that some of these agents may cause harm following sting from some species.

More recent evidence has emerged that suggests that the application of heat to the affected area of the sting may work to decrease pain following jellyfish envenomation. In addition, alternative agents such as lidocaine, may be useful in the alleviation of pain following jellyfish sting. This review sought to examine any new scientific literature in regards to first aid for jellyfish stings, with an emphasis on species found in coastal and territorial waters of the United States.

Summary of Scientific Foundation:

Jellyfish envenomation in North America may be painful but is rarely life threatening. Often the species of jellyfish causing the envenomation is unknown making the need for universal treatment recommendations necessary. In the treatment of jellyfish envenomation there are two important concepts: inhibiting further nematocyst discharge and subsequent pain relief. During envenomation the tentacle may break off the body and remain adhered to this victim. In addition, there is the concept that even if the tentacle no longer remains, undischarged nematocysts may

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remain on the skin and further physical or chemical stimulus may result in discharge of the remaining nematocyst, worsening envenomation.

Acetic acid (vinegar) has traditionally been applied to inhibit further nematocyst discharge, but the studies providing evidence for its efficacy in different species, and even in the same species, is limited and often contradictory. Although Turner indicates that acetic acid was more beneficial than a commercial sting aid and salt water, Birsa suggests that acetic acid may stimulate nematocyst discharge in *Physalia spp.* Birsa also found that acetic acid appeared to cause more nematocyst discharge in relation to salt water for *Chrysaora quinquecirrha* (Sea nettle). Burnett, however, reported that acetic acid blocked further nematocyst discharge from other chemical agents. Morabito suggests that for *Pelagia noctiluca* acetic acid reduced nematocyst discharge. Due to the variability of this evidence it is difficult to continue to recommend acetic acid as the type of jellyfish involved in the sting is often unknown. In addition, it is unknown how many undischarged nematocysts remain on the victims skin after contact with the jellyfish and whether or not this treatment is clinically useful.

Studies in Hawaiian waters suggest that hot water and hot packs are more efficacious in relieving pain than acetic acid, analgesics/benzodiazepines and cold packs. This includes evidence for *Physalia spp.* and *Alatina (Carybdea) alata* provided by Thomas, Nomura and Yoshimoto. Loten also found that hot water was better than ice pack for *Physalia spp.* for producing pain relief. Salt water does not appear to induce nematocyst discharge and would therefore be safe for irrigation.

In US coastal Atlantic waters Lopez found that hot packs performed better than cold packs in relieving pain following jellyfish stings in Florida waters. Heat seems to be efficacious in *Physalia spp.*, whereas acetic acid may cause nematocyst discharge (Birsa). Acetic acid may also induce some nematocyst discharge in the sea nettle (Birsa, Burnet). Lidocaine does appear to inhibit nematocyst discharge in both *Physalia physalis* and *Chrysaora quinquecirrha* (sea nettle). Salt water does not appear to induce nematocyst discharge.

The only data found regarding continental North American Pacific waters is regarding the Lion's Mane jellyfish. One small study found that heat immersion was more efficacious at relieving pain and itching than lidocaine (Knudsen).

In US coastal waters jellyfish envenomation can rarely be life threatening and can be caused by direct venom effect or allergic reaction. Following jellyfish envenomation ABC's should be assessed. For signs of shock the patient should be placed in the supine position.

In Hawaiian waters, remove any remaining tentacles with a blunt object to avoid further stings. Rinse the affected area with sea water and follow by application of hot water or hot pack (approximately 106-113°F). If a hot pack is not available a cold pack can be used to attempt to relieve the pain.

In costal Gulf or Atlantic waters, remove any remaining tentacles with a blunt object to avoid further stings. Rinse the affected area with sea water. If topical lidocaine is available, this can be applied to inhibit further nematocyst discharge and provide pain relief. This should be followed

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by application of hot water or hot pack (approximately 106-113°F). If a hot pack is not available a cold pack can be used to attempt to relieve the pain.

In US coastal pacific waters it would be reasonable to treat as for Hawaiian waters. Remove any remaining tentacles with a blunt object to avoid further stings. Rinse the affected area with sea water and follow by application of hot water or hot pack (approximately 106-113°F). If a hot pack is not available a cold pack can be used to attempt to relieve the pain.