WORKSHEET for Evidence-Based Review of Science for First Aid

**Worksheet author(s)**
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**Date Submitted for review:** December 10, 2008

**Revision submitted:** October 5, 2009

**Clinical question.**
In individuals who have received a jellyfish sting (P), does the application of heat or cold (I) decrease pain or prevent worsening (O) as compared to not applying heat or cold (C)?

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** Intervention/Therapy.

**State if this is a proposed new topic or revision of existing worksheet:** New topic.

**Conflict of interest specific to this question**
Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No.

**Search strategy (including electronic databases searched).**
- Pub Med – “marine toxins” (MeSH) OR “Fishes, poisonous” (MeSH) OR “Polychaeta” (MeSH) OR “Crustacea” (MeSH) OR “Horseshoe Crabs” (MeSH) OR “Bryozoa” (MeSH) OR “Hyperotreti” (MeSH) OR “Hydrozoa” (MeSH) OR “Scyphozoa” (MeSH) OR “Anthozoa” (MeSH) OR “Cubozoa” (MeSH) OR “Ctenophora” (MeSH) OR “Echinodermata” (MeSH) OR “Mollusca” (MeSH) OR “Plankton” (MeSH) OR “Hydrophilidae” (MeSH) OR “Cetacea” (MeSH) OR “Emergency Treatment” (MeSH) OR “Bites and Stings Therapy” (MeSH) AND “marine” and “bite” OR “sting” OR “envenom” (86 hits).
- Also, Pub Med – “Jellyfish” OR “Marine” AND “First Aid” as text words, all fields (22 hits). Also, Pub Med “marine” AND “bites” AND “stings” as text words, all fields (139 hits).
- AHA End Note Library on “Jellyfish” OR “Marine Bites” OR “Marine Stings” (3 hits)
- Cochrane database for systematic reviews – “Jellyfish” OR “stingrays” AND “first aid” as text words, all fields (8 hits).
- EMBASE – “jellyfish envenomation” AND/OR “stings” (2,154 hits), then combined with “first aid” (80 hits).
- Review reference lists of all relevant articles.

**State inclusion and exclusion criteria**
Studies were selected after applying the appropriate search terms (listed above) and excluding irrelevant articles. All English-only, peer-reviewed articles resulting from this search met the inclusion criteria. Abstract only publications, single case studies, and review papers and letters were excluded.

**Number of articles/sources meeting criteria for further review:**
Six evidence-based research studies met criteria for inclusion. Of these, three were LOE 2, two were LOE 3, and one was LOE 4.
# Summary of evidence

## Evidence Supporting Clinical Question

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<th>Level of evidence</th>
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<th>Fair</th>
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<td>Loten et al., 2006, 329-E1; Nomura et al., 2002, 624-E1; Thomas et. al., 2001, 100-E1</td>
<td>Yoshimoto and Yanagihara, 2002, 300-E1; Atkinson et al., 2006, 503-E1</td>
<td>Exton et al., 1989, 625-E1</td>
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**Level of evidence**

- **A** = Return of spontaneous circulation
- **B** = Survival of event
- **C** = Survival to hospital discharge
- **D** = Intact neurological survival
- **E** = Other endpoint – Decreased pain (E1); Prevent further envenomation (E2); Inactivate venom load (E3)

*Italics = Animal studies*
# Evidence Neutral to Clinical question

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**Thomas et al., 2001, 100-E 1**

- **A** = Return of spontaneous circulation
- **C** = Survival to hospital discharge
- **E** = Other endpoint – Decreased pain (E1); Prevent further envenomation (E2); Inactivate venom load (E3)

**Evidence Opposing Clinical Question**

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**A** = Return of spontaneous circulation

**C** = Survival to hospital discharge

**B** = Survival of event

**D** = Intact neurological survival

**E** = Other endpoint – Decreased pain (E1); Prevent further envenomation (E2); Inactivate venom load (E3)

*Italics = Animal studies*
There is an abundance of literature on marine bites and stings. Unfortunately, the treatment of marine bites and stings has largely been based on anecdotal evidence, and there are few evidence-based studies on this topic. Most studies on marine bites and stings relate to jellyfish stings, with most of these related to jellyfish stings specific to Hawaiian and Australian waters.

The majority of studies support the use of hot water immersion (HWI) to reduce the pain from most jellyfish stings (Nomura et al., 2002, 624; Yoshimoto and Yanagihara, 2002, 300; Atkinson et al., 2006, 503; Loten et al., 2006, 329). These were good quality LOE 2 and LOE 3 studies. Loten et al. (2006, 329) concluded that immersion in water at 45 degrees Celsius for 20 minutes is an effective and practical treatment for pain from bluebottle stings.

One good LOE 2 study concluded that hot dry packs and less so cold packs provide statistically significant relief from the pain of box jellyfish stings in comparison to thermoneutral (control) dry packs, but that the effect of either was mild enough to be of questionable clinical benefit (Thomas et al., 2001, 100). One other study showed relief of pain with cold packs (Exton et al., 1989, 625), but it was a LOE 4 study with poor support.

Acknowledgements: None.

Citation List


Note: LOE 3, Good; retrospective review of all evidence for hot water immersion (HWI); Summary of Evidence Supporting.


Note: LOE 4, Poor; Summary of Evidence Supporting.


Note: LOE 2, Good; Summary of Evidence Supporting.


Note: LOE 2, Good; Summary of Evidence Supporting.

Note: LOE 2, Good; Summary of Evidence Neutral.


Note: LOE 2, Good; Summary of Evidence Supporting.