



60th Annual Meeting

Sparkle Shine Celebrate!

Hidden Hazards of the Natural World: Toxicology Essentials for Pharmacists

KC O'Brien, PharmD, DABAT, BCEMP

Clinical Pharmacist – Emergency Medicine | Orlando Regional Medical Center

1



60th Annual Meeting

Sparkle Shine Celebrate!

Disclosure

I do not have a vested interest in or affiliation with any corporate organization offering financial support or grant monies for this continuing education activity, or any affiliation with an organization whose philosophy could potentially bias my presentation (within the last 12 months).

2



60th Annual Meeting

Sparkle Shine Celebrate!

Presentation Objectives

Pharmacist Objectives:

1. Identify sources of natural toxins and recognize their characteristic clinical presentations.
2. Differentiate between major toxin mechanisms and envenomation pathophysiology to guide appropriate triage, supportive care, and evidence-based pharmacologic management.
3. Apply current recommendations for prevention, patient counseling, and risk mitigation related to environmental poisonings.

Technician Objectives:

1. Identify sources of natural toxins and recognize their characteristic clinical presentations.
2. Differentiate between major toxin mechanisms and envenomation pathophysiology to guide appropriate triage, supportive care, and evidence-based pharmacologic management.

3



60th Annual Meeting

Sparkle Shine Celebrate!

MARINE ENVENOMATION

4



60th Annual Meeting

Sparkle Shine Celebrate!

Epidemiology

- Most exposures occur during the warm summer months (June – August)
- Stingrays and members of Scorpaenidae and Cnidaria are responsible for the majority of envenomation
- Poison center data show a higher proportion among young males (<30 years old)
- Spiny fish envenomation is most common among fishermen, waders, and owners of spiny fish
- Serious injury is rare



"Mauve stingers" washed ashore in Cocoa Beach, FL (2011)

Kirchberg TH, et al. Nationwide Aquatic Envenomations Reported to US Poison Control Centers from 2011 to 2020. Wilderness Environ Med. 2024 Mar;35(1):22-29.
Image: Alison Boutlier

5



60th Annual Meeting

Sparkle Shine Celebrate!

CNIDARIA

6

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Cnidaria

Müller-Karger et al. (2021). Fieldable Environmental DNA Sequencing to Assess Jellyfish Biodiversity in Nearshore Waters of the Florida Keys, United States. *Frontiers in Marine Science*. 8: 640527. 10.3389/fmars.2021.640527.

7

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Cubozoa

Chiropsalmus quadrumanus
"Four-handed Box Jelly"

Tripedalia cystophora
"Mangrove Box Jelly"

Images: Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, Jan Bieleki

8

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Hydrozoa

Physalia physalis
"Portuguese man o'war"

Millepora alcicornis
"Fire coral"

Velella velella
"By-the-wind sailor"

Images: Ianaré Sévi, Nick Hobgood, Evan Baldonado

9

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Scyphozoa

Stomolophus meleagris
"Cannonball/cabbagehead jellyfish"

Cassiopea xamachana
"Upside down jellyfish"

Linuche unguiculata
"Thimble jellyfish"

Images: Judy Gallagher, Bjoertvedt, Global Biodiversity Information Facility

10

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Scyphozoa

Chrysaora quinquecirrha
"East coast sea nettle"

Aurelia aurita
"Moon jellyfish"

Images: Jarek Tuszyński, Luc Viatour

11

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Scyphozoa

Pelagia noctiluca
"Mauve stinger"

Drymonema larsoni
"Pink meanie"

Images: Hans Hillewaert, Liza Gomez Daglio

12

Envenomation Mechanism

Discharge is activated by chemical or physical stimulation of cnidocyte

Coiled thread within the capsule is pushed out by osmotic pressure

Barbed apparatus penetrates organism, injecting venom

Labels in diagram: Cnidocyte (trigger), Cell membrane (base wall), Cell membrane (top wall), Barbs, Nematocyst, Cell nucleus.

13

Category	Examples	Effects
Enzymes	Phospholipase A2, metalloproteinases	Cytolytic, hemolytic
Pore-forming toxins	Actinoporins, hyaluronins	Cytolytic, hemolytic, cardiotoxic, myotoxic
Neurotoxins	Na, K VGC inhibitors	Neurotoxic, paralytic
Non-protein bioactive components	Serotonin, histamine	Vasodilatory, pain

14

Factors Associated with Envenomation

- Warm weather
- Low winds
- Low precipitation
- Ocean pH and temperature

15



FSHP

20th Annual Meeting

**Sparkle Shine
Celebrate!**

Clinical Presentation

- Erythema, rash that may have a linear distribution
- Evolution of dermal eruption: initial urticarial pattern followed by superficial skin necrosis
- Pain may range from mild stinging and irritation to severe pain
- Pain may be delayed in onset and peak
- Systemic signs are less common with species encountered off the Florida coast
 - Encounter may trigger allergic or anaphylactic response
 - Malaise, nausea, myalgia, muscle spasm, headache, vertigo



Bahla KS, Stollbach A. Marine envenomations. Emerg Med Clin North Am. 2014 Feb;32(1):223-43.
 Haddad V Jr, et al. An outbreak of Portuguese man-of-war [Physalia physalis - Linnaeus, 1758] envenoming in Southeastern Brazil. Rev Soc Bras Med Trop. 2013 Sep-Oct;46(5):541-4.

16



**MANAGEMENT OF CNIDARIA
ENVENOMATION**

17



ESHP 20th Annual Meeting



**Sparkle Shine
Celebrate!**

Cnidaria Management

- Use general resuscitation principles
 - Use caution to avoid injury to rescuer via unfired nematocysts
 - Anaphylactic reactions are uncommon, but more likely in previously stung individuals and may cause rapid deterioration
- Prevent further envenomation
 - Inactivate cnidae via rinsing
 - Remove the tentacles
 - Ideally with tweezers to lift rather than scrape
 - Caution for hospital personnel—gloves while handling patient/clothing
 - Pressure immobilization bandage unlikely to benefit
- Provide temperature-based intervention
- Offer supportive pharmacologic care for pain and discomfort

A	Airway
B	Breathing
C	Circulation
D	Disability
E	Exposure

Yanagihara, A. A., & Wilcox, C. L. (2017). Cubozoon Sting-Site Seawater Rinse, Scraping, and Ice Can Increase Venom Load: Upending Current First Aid Recommendations. *Toxins*, 9(3), 105.

18

20th Annual Meeting

Sparkle Shine Celebrate!

Optimal Rinse Solution?

- Goal is to prevent additional nematocyst discharge while removing adherent tentacles
- Acetic acid, sea water, fresh water, commercial solutions and more have previously been proposed
- Conflicting methodology and conclusions cloud recommendations

Image: Juvan Vd Westhuizen
Bernigante A, et al. Impact of Scyphozoan Venoms on Human Health and Current First Aid Options for Stings. Toxins (Basel). 2018 Mar 23;10(3):133.
 Vengalil A, et al. (2017) Culexoides Sting Site Swelling, Stinging, and Ice Can Increase Venom Load Upgrading Current First Aid Recommendations. Toxins, 9(3), 105.
 Vengalil A et al. Evidence-Based Management of Sea-Inflicted Stings. Wilderness, 2021, Sep 15:1005424;https://doi.org/10.1016/j.wild.2021.1005424.

19

20th Annual Meeting

Sparkle Shine Celebrate!

Optimal Rinse Solution

- Simulation of *Physalia* spp sting event after pretreatment with commonly recommended solutions
- Tentacles immersed in solution for 10 minutes before provoking discharge

First-Aid Solution	Cnidate Discharge (%)	
	<i>P. physalis</i> (Atlantic)	<i>P. physalis</i> (Pacific)
Seawater	10.52 ± 0.26 *	10.38 ± 0.13 *
Freshwater	40.94 ± 02.88 *	12.01 ± 0.61
Urine	42.54 ± 06.88 *	12.87 ± 02.61 *
Sting No More® Spray	10.03 ± 03.00 *	01.06 ± 00.06 *
Permethrin	46.64 ± 02.97 *	44.06 ± 13.79 *
Alcohols		
10% Ethanol	not tested	03.23 ± 01.32
30% Ethanol	not tested	03.90 ± 01.62
70% Ethanol	13.71 ± 03.68 *	13.58 ± 05.63 *
>95% Ethanol	33.96 ± 04.35 *	37.74 ± 02.78 *
Vinegars		
White Vinegar	01.04 ± 00.04	00.20 ± 00.20
Cider Vinegar	00.31 ± 00.13	00.69 ± 00.39
Malt Vinegar	00.47 ± 00.38	00.73 ± 00.43

Wilcox CL, et al. Assessing the Efficacy of First-Aid Measures in *Physalia* sp. Envenomation, Using Solution- and Blood Agarose-Based Models. Toxins (Basel). 2017 Apr 26;9(3):149.

20

20th Annual Meeting

Sparkle Shine Celebrate!

Optimal Rinse Solution

Test Solution	Good Performers	Poor Performers
Readily Available		Seawater, tap water, urine, shaving cream, baking soda, dish soap
Acetic Acid Solutions	White, cider, malt, and balsamic vinegars (3-5%)	Concentrated vinegars (10-75%) in seawater solutions
Other Acidic Solutions		Saline/HCl, lemon juice, Cola
Alcohols		Ethanol, isopropanol
Commercial Products	Sting No More ®	Copper gluconate solution, Magnesium sulfate, lidocaine 4%

Wilcox CL, et al. Assessing the Efficacy of First-Aid Measures in *Physalia* sp. Envenomation, Using Solution- and Blood Agarose-Based Models. Toxins (Basel). 2017 Apr 26;9(3):149.

21

20th Annual Meeting

Sparkle Shine Celebrate!

Optimal Rinse Solution

- Repeated simulation to assess hemolytic potential of venom
- Conclusion
 - Vinegar as a rinse solution is widely available
 - Strongest evidence for *Physalia* but reasonable as general initial rinse approach
- Limitations
 - Duration of treatment?
 - Sting No More® is a proprietary blend sold by one of the authors

Wilcox CL, et al. Assessing the Efficacy of First-Aid Measures in *Physalia* sp. Envenomation, Using Solution- and Blood Agarose-Based Models. Toxins (Basel). 2017 Apr 26;9(3):149.

22

20th Annual Meeting

Sparkle Shine Celebrate!

Optimal Rinse Solution

- 2012 review: avoid vinegar except for *Physalia*, but additional evidence seems to support use for other local Cnidaria species
- 2018 review of Scyphozoa: mixed evidence for vinegar
 - Previously thought deleterious for *P. noctiluca* but more recent evidence supports use
 - May worsen pain in *Chrysaora quinquecirrha*
- Bottom line:** a vinegar rinse is reasonable for most local Cnidaria organisms
 - Prefer vinegar for *Physalia*
 - Consider saltwater for *Chrysaora quinquecirrha*
 - Fresh water should not be recommended unless no alternative is available

Ward NT, et al. Evidence-based treatment of jellyfish stings in North America and Hawaii. Ann Emerg Med. 2012 Oct;60(4):399-414.
 Bernigante A, et al. Impact of Scyphozoan Venoms on Human Health and Current First Aid Options for Stings. Toxins (Basel). 2018 Mar 23;10(3):133.

23

20th Annual Meeting

Sparkle Shine Celebrate!

Hot or Cold?

- Potential advantage of heat in inactivation of venom components at 40-45 °C
 - Appears to be effective against all Cnidaria venoms from all classes
- Potential pain receptor modulation influencing perceived pain
- Systematic review by Wilcox, et al conducted on published research through January 2016
- Included 19 publications and abstracts
 - Level I (3), Level II (0), Level III (3), Level IV (13)

"The preponderance of evidence demonstrates that hot-water immersion is a safe and effective method of reducing pain from cnidarian envenomations"

Wilcox CL, et al. Heated Debates: Hot-Water Immersion or Ice Packs as First Aid for Cnidarian Envenomations? Toxins (Basel). 2016 Apr 1;8(4):97.

24

Wilcox CL, et al. Heated Debates: Hot-Water Immersion or Ice Packs as First Aid for Cnidarian Envenomations? *Toxins* (Basel). 2016 Apr 1;8(4):97.

25

- Supportive pharmacologic care
 - NSAIDs, acetaminophen, opioids
 - Topical lidocaine may be beneficial, especially for *Chrysaora quinquecirrha*, *Physalia physalis*, *Chiropsalmus quadrumanus*
 - Topical steroid for more severe dermal presentation
 - Topical calamine
- Educate patient to wash swimwear prior to re-use
 - Use gloves when handwashing
 - Machine-wash when able

Remigante A et al. Impact of Scyphozoan Venoms on Human Health and Current First Aid Options for Stings. Toxins (Basel). 2018 Mar 23;10(4):133.

26

- Anaphylaxis
 - Uncommonly reported in the literature despite the high prevalence of Cnidaria encounters
 - Possibly related to antigenic venom components or even deposition of biopolymers such as chitin and small collagen-type material
 - Patients may experience dermal eruptions accompanied by dyspnea, hypotension, or angioedema
 - Appears to respond well to standard treatment for anaphylaxis
- Irukandji-like syndrome?

Targies AC, Burnet JW, Kogej Sokolka A, Lichtenstein LM. Anaphylaxis after contact with jellyfish. *J Allergy Clin Immunol*. 1993 Jun;79(5):672-6.

Jornatani et al. Jellyfish anaphylaxis: A wide spectrum of sensitization modes. *allergy*. 2020 May 1;107(5):158-166.

Viana Net al. Probable Ixodes Ixodes Tick Syndrome in the US Florida Keys. *Ann N Y Acad Sci*. 2019 Jun 2;1470:107-118.

Tillett J, Vanaghiya AD, Turner HC, Winkler K. Immunological and serological responses to jellyfish stings. *J Inher Inher Dis*. 2011 Oct;38(10):639-646.

27

- Associated with *Carukia barnesi* (off the coast of Australia) and other Australian jellyfish
- Reported with other Cnidaria species including *Physalia physalis*

Carukia barnesi

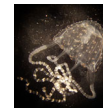
"Irukandji jellyfish"



Physalia physalis

"Portuguese man o'war"





Images: Ianaré Sévi, Lisa-ann Gershwin
Tibbalti J. (2008). Mechanism of cardiac failure in Irukandji syndrome and first aid treatment for stings. *Anaesthesia and Intensive Care*.
Crady JD, Burnett JW. Irukandji-like syndrome in South Florida divers. *Ann Emerg Med*. 2003 Dec;42(6):763-6.

28

- Pathophysiology: Massive catecholamine release, potentially via Na channel modulation

Latent period of 5 - 40 minutes with burning, pruritic sensation

Severe diffuse muscle spasms primarily of the back

Headache, restlessness, "impending doom"

Hypertensive crisis that may be complicated by intracranial hemorrhage, pulmonary edema, global ventricular dysfunction

Improvement over 6-12 hours, recovery may take place over days

Tibbals, J. (2001). Mechanism of cardiac failure in Irukandji syndrome and first aid treatment for stings. *Anaesthesia and Intensive Care*.

Grady JD, Burnett JW. Irukandji-like syndrome in South Florida divers. *Ann Emerg Med*. 2003 Dec;42(6):763-6.

29

- Obtain CMP, CK; imaging for headache or altered mental status; EKG, cardiac biomarkers, echocardiogram

- **Treatment**
 - Vinegar rinse if not conducted pre-hospital
 - Hot water immersion
 - Aggressive targeting of pain, muscle spasm (i.e. NSAID, opioid, benzodiazepines, skeletal muscle relaxants)
 - Blood pressure control for severe elevation
 - Prefer titratable agents—severe cases may deteriorate into hypotension
 - Esmolol, nicardipine, phenoltamine
 - IV magnesium does not appear beneficial

CMP: comprehensive metabolic panel, CK: creatine kinase, PCA: patient-controlled analgesia

Grady JD, Burnett JW. Irukandji-like syndrome in South Florida divers. *Ann Emerg Med*. 2003 Dec;42(6):763-6.

McCullagh N, et al. Randomised trial of magnesium in the treatment of Irukandji syndrome. *Emerg Med Australas*. 2012 Oct;24(5):560-5.

Yanagihara AA, et al. Evidence-Based Management of Box Jellyfish Stings. *MJ Med*. 2025 Sep 13(9)(Supplement, 2):589-598.

30

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

Seabather's Eruption

- Likely venom and immune-mediated response to *Linuche unguiculata*, *Edwardsiella lineata* larvae trapped between skin and bathing suit
- Characteristic suit-patterned papular pruritic rash
- Rash may be delayed in onset and resolve over 2 weeks
- Systemic symptoms less common
 - Chills, headache, nausea/vomiting, malaise
 - Appear more common in pediatric cases



Wong DE, et al. Seabather's eruption. Clinical, histologic, and immunologic features. *J Am Acad Dermatol.* 1994 Mar;30(3):399-406.
 Freudenthal AR, et al. Seabather's eruption. *N Engl J Med.* 1993 Aug 19;329(8):542-4.

31

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

Seabather's Eruption

First aid

- Vinegar rinse for nematocyst inactivation
- Remove swimsuit
- Rinse as soon as able, full shower when able

Supportive pharmacologic care

- Topical steroids (high potency often required)
- Topical or oral antihistamines
- Consider oral glucocorticoid course for patients with systemic or severe symptoms
- Antimicrobial treatment may be needed for infection secondary to excessive scratching

Prevent re-injury

- Instruct patient to wash suit with detergent prior to re-use

Wong DE, et al. Seabather's eruption. Clinical, histologic, and immunologic features. *J Am Acad Dermatol.* 1994 Mar;30(3):399-406.
 Freudenthal AR, et al. Seabather's eruption. *N Engl J Med.* 1993 Aug 19;329(8):542-4.

32

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

STINGRAYS AND SPINY FISH

33

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

Stingrays

- Class: Chondrichthyes
- Variety of species found around Florida's coast
- Serrated barb saturated with venom from ventrolateral grooves
- Most life-threatening injury tends to be trauma-related rather than venom-related

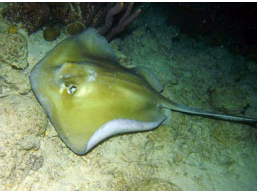



Image: Dan Hershman

34

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

Stingray Venom Composition

- Venom contains amino acids, serotonin, 5'-nucleotidase, and phosphodiesterase
- Recent venom analysis via transcriptome analysis conducted in two freshwater and three marine stingrays:

Venom Component	Role/effect
Serine proteases, metalloproteinases, PLA2?	Alter coagulation via fibrinogenolytic enzymes
GPCR Ca signaling	Pain
Histamine, bradykinin, serotonin	Nociceptor hypersensitivity contributing to hyperalgesia
TCTP	Edema
Hyaluronidase	Venom spreading factor
Bibrotin and cholecystoxin	Neuropathic pain and inflammation

GPCR: G-protein coupled receptor, Ca: Calcium, TCTP: translationally-controlled tumor protein
 Auerbach PS. Marine Envenomations. *N Engl J Med.* 1991 Aug 15;325(7):486-93.
 Kirchhoff KN, et al. Stingray Venom Proteins: Mechanisms of Action Revealed Using a Novel Network Pharmacology Approach. *Mar Drugs.* 2021 Dec 24;20(1):27.

35

FSHP

60th Annual Meeting

Sparkle Shine Celebrate!

Stingray Envenomation

- Pain out of proportion to appearance of wound with peak at 30-90 min and persisting for 48 h
- Local edema, erythema, petechiae, bullae
 - Potential for necrosis, ulceration
- Systemic: weakness, nausea, vomiting, diarrhea, vertigo, headache, syncope, seizures, muscle cramps, fasciculations
- Most serious venom effects may include hypotension, dysrhythmias, anaphylaxis
- Complications not related to venom may arise from trauma and infection secondary to bacteria introduced through the wound

Meyer PK. Stingray injuries. *Wilderness Environ Med.* 1997 Feb;8(1):24-8.

36

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Notable Spiny Fish

Pterois volitans
Lionfish



Scorpaena plumieri
Spotted scorpionfish



Ariopsis felis
Hardhead catfish



Image: Chad Sparkes, John Soward, Zachary Randall

37

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Clinical Manifestations of Spiny Fish Envenomation

Local Effects

Systemic Effects

- Erythema
- Ecchymosis
- Edema
- Paresthesia of affected area
- Less common: blistering and skin necrosis

- Nausea, vomiting
- Diaphoresis
- Dyspnea
- Abdominal pain
- Hypotension
- Paralysis of extremities (rare)

Morris, J. et al. (2020). A Case Study of Lionfish Sting-Induced Paralysis. AACU, BioRxiv, 5.
Hedrick V. P. et al. Report of 15 injuries caused by lionfish (*Pterois volitans*) in equine in Brazil: a critical assessment of the severity of envenomations. J. Venom. Anim. Toxicol. Trop. Dis. 2015 Mar 20(2).
Trenham J. et al. Lionfish sting experiences of an island poison center: a retrospective study of 23 cases. Vet Hum Toxicol. 1989 Apr;30(2):173-5.

38

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Hot Water Immersion for Stingrays and Spiny Fish

- Hot water immersion
 - Most data for stingray envenomation
 - Partial to complete relief in 94% of 51 cases of Scorpaenidae envenomation reported to one poison center (California)
- 2006 review suggests extrapolation to Scorpaenidae is reasonable

Study	Inclusion	Intervention	Outcome
Russell 1958	6 participants injected with stingray venom in paired trial with crossover	HWI Cold water immersion	Initial pain relief and analgesia at 30 minutes in HWI
Trestrail 1989	23 Lionfish stings in retrospective case series	HWI	Pain relieved in 15/25 cases treated with HWI
Kizer 1985	51 fish stings (45 lionfish, 6 scorpionfish) in retrospective case series	HWI	Complete pain relief in 30/38 cases

Kizer KW, et al. Scorpaenidae envenomation. A five-year poison center experience. JAMA. 1985 Feb 8;253(6):807-10.
Atkinson PR, et al. Is hot water immersion an effective treatment for marine envenomation? Emerg Med J. 2006 Jul;23(7):503-8.

39

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Hot Water Immersion: Safety Considerations

- Avoid secondary injury
 - 5-year review in one burn service of iatrogenic thermal burns secondary to marine stings identified 9 patients
 - All 9 patients conducted hot water immersion at home
 - Education plays a role in minimizing iatrogenic thermal injury
- Practical ways to perform HWI safely
 - Check temperature with thermometer to target approximately 43-45 °C (most thermometers should register up to 110 °F, which would be adequate)
 - Limit to 30-90 minutes (ideally in 30-minute intervals with reassessment)
 - Submerge unaffected extremity to compare tolerance
 - May use heat pack as alternative to immersion (after rinsing)
 - Delay opioid use until after HWI is complete

Lewis CJ, et al. Iatrogenic Thermal Burns Secondary to Marine Sting Treatment. J Burn Care Res. 2020 Jul 3;41(4):878-881.
Ni S, et al. A Novel Approach to the Treatment of a Stingray Injury to the Abdomen. R J Med J (2013). 2023 Sep 1;106(8):9-10.

40

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Stingray and Spiny Fish Management

Wound management

- Irrigate, clean wound
- Tetanus prophylaxis as needed
- Antimicrobial treatment for infected wounds
 - Per local protocol, and should include *Vibrio* coverage
 - Also consider prophylaxis for extensive injury or immunocompromised patient

Analgesia

- NSAIDs, acetaminophen, opioids
- Topical steroid
- Topical lidocaine or lidocaine infiltration
- Digital block has been reported with success in refractory cases

Garyfalou CT, Madden JF. Lionfish envenomation. Ann Emerg Med. 1996 Oct;28(4):456-7.
Cavali S, et al. Infections following stingray attacks: A case series and literature review of antimicrobial resistance and treatment. Travel Med Infect Dis. 2022 May-Jun;75:10232.

41

FSHP 60th Annual Meeting Sparkle Shine Celebrate!

Stingray and Spiny Fish Management

- Radiograph (or ultrasound) for suspected retained foreign body
- Surgical consultation
 - Retained barb/spine for removal/wash out
 - Vascular/tendon disruption
 - Traumatic injury extending to other organs
 - Necrotic tissue




O'Malley GF, et al. Retained Stingray Barb and the Importance of Imaging. Wilderness Environ Med. 2015 Sep;26(3):375-9.
Gordon Het al. Clinical Considerations in Initial Evaluation and Treatment of Hardhead Catfish Spine Puncture Wounds. Case Rep Emerg Med. 2021

42



FSHP 60th Annual Meeting



**Sparkle Shine
Celebrate!**

Risk Mitigation

- Prepare in advance for jellyfish blooms
 - Research beach location
 - Avoid water during blooms
 - Use caution when walking barefoot on beaches
- Note purple flag warning at beaches
- Topical prevention
 - Rash guards, wetsuits can minimize contact with jellyfish
 - Safe Sea® sunscreen?

BEACH WARNING FLAGS
Beach Warning Flags: www.beachwarningflags.com

	Water Closed to Public Swimming Prohibited
	High Hazard High Surf and/or Strong Currents People: Stay Out of Water; Children: Stay Out
	Medium Hazard Moderate Surf and/or Currents People: Swim Carefully; Children: Swim Closely Watched
	Low Hazard Calm Conditions. Exercise Caution
	Dangerous Marine Life Swim with Caution

© 2010 Beach Warning Flags, Inc. All Rights Reserved



FSHP
60th Annual Meeting



Risk Mitigation

Sparkle Shine
Celebrate!

Safe Sea® sunscreen is intended to inhibit jellyfish stings through a physical barrier and interference with chemoreceptor activation and osmotic trigger of nematocysts

Design	Double-blinded RCT in 2006 compared Safe Sea® SPF 15 with Copertone® SPS in Dry Tortugas National Park and Belize
Methods	10 participants with application of Safe Sea® to one side of the body and Copertone® to the other and snorkeled for up to 45 minutes
Results	Sea Safe® 2 stings compared to 11 with placebo
Strengths	Real-world environment and activity
Limitations	Small population, self-reported stings, real-world application of product may be inconsistent, responsible organism unknown

Low risk, but would not depend on the product in lieu of avoiding high-activity zone

Boulianne DR. A randomized, controlled field trial for the prevention of jellyfish stings with a topical sting inhibitor. J Travel Med. 2006 May-Jun;13(3):166-71.

- The Beach Conditions Reporting System provides a variety of information including active beach warning flags and jellyfish reports
- <https://visitbeaches.org/map>



Questions?



Thank you for your participation!