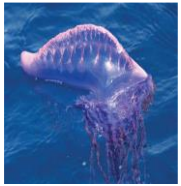


Prevention and Management: Marine Life Exposures including Envenomation

HAZARD	MECHANISM OF INJURY	PREVENTION	SIGNS AND SYMPTOMS	POST EXPOSURE TREATMENT	ANTIVENOM
Box jellyfish (<i>Chironex leckeri</i>) 	Contact with box jellyfish triggers the most powerful and lethal envenomation process known to science. The result of myriad microinjections caused by cnidocytes present in their tentacles; these cnidocytes contain nematocysts, a subcellular structure that will fire when touched, injecting its venom.	Thoroughly research the areas where you intend to be in the water and avoid known box-jellyfish habitats if you are not sure the area is safe.	Itchy red rash, burning pain, edema, and classical ladder-rung pattern lesion. Nausea, vomiting, muscle spasms, fever, and chills. Respiratory distress, hypotension, and dysrhythmia.	Call for emergency medical assistance (Dial 997 in Kingdom); otherwise, victims should be transported to a hospital without delay. If you are stung, cardiovascular stability can rapidly deteriorate, allowing little time for any effective field intervention. To deactivate envenomation, irrigate with vinegar, hot water shower as tolerated for 10–20 min, pain management including local use of cold packs/ice and opiates, and supportive care. Do not use pressure immobilization bandages.	Treat with Antivenom
Portuguese man-of-war (<i>Physalia physalis</i> and <i>Physalia utriculus</i>) 	Contact with Portuguese man-of-war can trigger an extremely painful envenomation process. The result of myriad microinjections caused by cnidocytes present in their tentacles; these cnidocytes contain nematocysts, a subcellular structure that will fire when touched, injecting its venom.	Be careful when swimming or diving in areas where these animals are known to be endemic. Submerged tentacles are usually found within the top 15-20 feet of the ocean. Mechanical protection is the best way to prevent stings and rashes. Wear full-body wetsuits regardless of water temperature. In areas where these animals are known to be endemic, a hooded vest may be the best way to protect your neck.	Local sharp pain immediately after the sting, followed by an erythematous maculopapular linear rash, local edema, and numbness. May include generalized malaise, headache, muscle spasms, vomiting, fever, elevated heart rate at rest (tachycardia), shortness of breath. Severe allergic reactions to the man-of-war's venom may interfere with cardiac and respiratory function.	Remove tentacles, preferably with forceps or gloved hand. Avoid using vinegar or methylated spirits. Hot water (45°C) immersion for 10–20 min preferred over local application of icepacks for pain control. Topical anesthetics can be considered after successful removal of all tentacle fragments. Use oral or parenteral analgesics if pain persists	Unavailable

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HAZARD	MECHANISM OF INJURY	PREVENTION	SIGNS AND SYMPTOMS	POST EXPOSURE TREATMENT	ANTIVENOM
Cone snail (<i>Conus geographus</i>) 	Injuries typically occur when the animal is handled. Cone snails administer stings by extending a long flexible tube called a proboscis and then firing a venomous, harpoonlike tooth (radula).	Do not handle cone snails if you come across them.	Mild to excruciating pain, weakness, diplopia. Conotoxins affect the nervous system and can cause paralysis, which could lead to respiratory failure and death.	Call for emergency medical assistance (Dial 997 in Kingdom); otherwise, victims should be transported to a hospital without delay. No specific treatment for cone-snail envenomation. Clean the wound with fresh water and provide care for a small puncture wound. Apply the pressure immobilization technique. Urgent intubation and critical care management if needed.	Unavailable
Blue-ringed octopus (<i>Hapalochlaena lunulata</i>) 	Blue-ringed octopus bite contains an extremely powerful neurotoxin called tetrodotoxin (TTX), which can paralyze a victim in minutes.	If encountered, simply avoid handling these animals. Blue-ringed octopi are not aggressive, and humans should not fear them. Avoid picking up bottles, cans or mollusk shells in areas the octopi inhabit, octopus den might be a small space accessible only through a tiny crevice	Bite is usually painless or no more painful than a bee sting. Usually start within minutes of envenomation, may include paresthesia of the lips and tongue, usually followed by excessive salivation, trouble with pronunciation (dysarthria), difficulty swallowing (dysphagia), sweating, dizziness, and headache. Flaccid paralysis and hypotension.	Call for emergency medical assistance (Dial 997 in Kingdom); otherwise, victims should be transported to a hospital without delay. No specific treatment for blue-ringed octopus envenomation. Clean the wound with fresh water and provide care for a small puncture wound. Apply the pressure immobilization technique. Wound excision is never recommended. Supportive care including mechanical ventilation if needed.	Unavailable

Prevention and Management: Marine Life Exposures including Envenomation

HAZARD	MECHANISM OF INJURY	PREVENTION	SIGNS AND SYMPTOMS	POST EXPOSURE TREATMENT	ANTIVENOM
Sea Snake (Family: Hydrophiidae)  	It contains peripheral neurotoxins acting at the acetylcholine receptor, and hemolytic and myotoxic compounds that cause muscle necrosis, hemolysis, and renal tubular damage.	Wear protective clothing and footwear (suitable wet skin or diver's suit). The sea snake prefers shallow inshore waters, it swims on the surface but usually drift by ocean currents.. Sea snakes are easily identifiable by their vertically flattened, paddle-shaped tail, and most species are not considered to be aggressive unless they are being handled, threatened, or it is mating season.	Signs of severe envenomation include myalgia, vomiting, eye signs (ptosis, weakness of external eye muscles, pupillary dilatation poorly reactive to light), paresis of lower motor neuron type, leucocytosis, and rhabdomyolysis • There is little local pain at the bite site • Signs of envenomation develop rapidly (approx. 15–30 minutes post envenomation)	Attention to basic life support is a priority • Pressure immobilization first aid should be used and left in situ until the patient reaches medical care • If there is clinical evidence of envenomation, sea snake antivenom can be given (based on beaked sea snake [Enhydrina schistosa] venom). If this not available tiger snake antivenom may be used • Supportive measures such as intubation and ventilation for respiratory failure or the treatment of hyperkalemia may also be required.	Treat with Antivenom
Stonefish, Lionfish, Scorpionfish (Family: Scorpaenidae)  	Spines are encapsulated by glandular venom-producing integumentary sheaths that release venom when mechanically disrupted through contact. All these fish possess spines on their dorsal, pelvic, and anal fins.	Avoid handling these fish and use puncture-proof gloves if handling is required. Be observant while entering or exiting the water, Stonefish are bottom feeder. Be aware of the global presence of these fish and their appearance.	Severe pain and edema at site of sting. Initial symptoms include intense burning pain at the puncture site. Systemic symptoms may include the following: a headache, weakness, diaphoresis, nausea, vomiting, abdominal pain, hypotension, chest pain, cardiac arrhythmias, myocardial ischemia, syncope, and even pulmonary edema.	Call for emergency medical assistance (Dial 997 in Kingdom); otherwise, victims should be transported to a hospital without delay. Rinse the wound with clean, fresh water. Remove any obvious foreign material. Control bleeding if needed. Allow small punctures to bleed for a minute immediately after being stung; this may decrease venom load. Apply heat. Immerse the affected area in hot water (upper limit of 113°F/45°C) for 30 to 90 minutes. NSAIDs, local analgesia, debridement if needed, and prophylaxis with antibiotics and receive tetanus prophylaxis as indicated.	Treat with Stonefish Antivenom

Prevention and Management: Marine Life Exposures including Envenomation

HAZARD	MECHANISM OF INJURY	PREVENTION	SIGNS AND SYMPTOMS	POST EXPOSURE TREATMENT	ANTIVENOM
Stingray (Suborder: Myliobatoidei) 	Stingrays are not aggressive, the defense mechanism consists of a serrated barb at the end of its tail, with venom glands located at the base of the barb. Stingrays will strike when threatened or stepped on. The barb can easily tear wetsuits and penetrate skin and may cause deep, painful lacerations.	Avoid stepping in murky or low-visibility shallow waters where stingrays naturally inhabit. Stingrays often burrow in the sand, making them difficult to see even in tropical waters. If you suspect stingrays may be in the area, carefully shuffle your feet while entering or exiting the water. This technique is known as the “stingray shuffle.” Stingrays are sensitive animals, and the vibrations caused by this shuffling may scare them away.	Stingrays can inflict mild to severe puncture wounds or lacerations. Symptoms include pain, which can be significant and intensify over several hours. Both puncture wounds and lacerations can damage major blood vessels, causing severe, potentially life-threatening bleeding. The barb usually breaks off, and removal may require professional surgical care. It is common for stingray wounds to become infected despite proper care. Possible infections include cellulitis, myositis, fasciitis and tetanus.	Call for emergency medical assistance (Dial 997 in Kingdom); otherwise, victims should be transported to a hospital without delay. Thoroughly clean the wound. Control bleeding if necessary. Tetanus prophylaxis as indicated.	Unavailable
Sea urchin (Class: Echinoidea) 	Sea urchins are covered in spines, which can easily puncture the skin and break off. Injuries usually happen when people step on sea urchins on while walking across shallow rocky bottoms or tide pools. People are often injured while swimming on the surface in shallow waters as well as when entering or exiting the water.	Be observant while entering or exiting the water, particularly when the bottom is rocky. Maintain a distance if swimming in shallow waters, near rocky shores or near other hard surfaces. Avoid handling these animals. And use puncture-proof gloves if handling is required.	Pain and puncture wounds, often multiple and localized. Skin scrapes and lacerations are also possible. Redness and swelling at site. Pain ranges from mild to severe. Multiple puncture wounds may cause limb weakness or paralysis, particularly with the long-spined species of the genus <i>Diadema</i>. On very rare occasions, life-threatening complications may develop.	Apply heat. Immerse the affected area in hot water (upper limit of 113°F/45°C) for 30 to 90 minutes. Remove any superficial spines with tweezers. Thoroughly wash the area, avoiding forceful rubbing or scrubbing. Apply antiseptic solutions or over-the-counter antibiotic ointments. Do not cover wound with bandage.	Unavailable

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HAZARD	MECHANISM OF INJURY	PREVENTION	SIGNS AND SYMPTOMS	POST EXPOSURE TREATMENT	ANTIVENOM
Fire corals (Family: Millepora) 	Contact with fire corals create a mild to moderate burning sensation. These cnidocytes contain nematocysts, a subcellular structure, which will fire when touched, injecting venom into the victim.	Avoid touching fire corals, which can be easily confused with other hard corals that usually do not cause harm when touched. Individuals who dive or swim in these areas without wearing a wetsuit or dive skin, even when exercising great care around corals, are susceptible to fire coral stings on exposed skin.	Burning sensation may last several hours and is often associated with a skin rash that appears minutes to hours after contact. The acute skin reaction will often subside in a day or two, but it may reappear several days or weeks after the initial rash disappeared. Lacerations, in which an open wound receives internal envenomation, are the most problematic fire-coral injuries. Venom from <i>Millepora</i> spp. is known to cause tissue necrosis on the edges of a wound. These injuries should be carefully observed, as necrotic tissue provides a perfect environment to culture serious soft-tissue infections.	Rinse the affected area with household vinegar. Redness and vesicles may develop. Do not puncture the vesicles; let them dry naturally. Keep the area clean, dry and aerated. For open wounds, seek a medical evaluation. Fire-coral venom is known to have dermonecrotic effects. Share this information with your physician before any attempts to suture an open wound, because the wound edges might become necrotic. Antibiotics and a tetanus booster may be necessary.	Unavailable

Please note: this document is intended for use as a reference document. If you feel unwell after research travel or have specific questions in regard to your upcoming research travel please contact KAUST Occupational Health @ occupational.health@kaust.edu.sa.

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