Stingers, Biters, Scrapers & Piercers

Each year, DAN Medical Services receives calls from divers, nondivers and healthcare professionals seeking advice on how to care for individuals with injuries from contact with marine life. Exotic organisms are well publicized; often the more mundane injuries cause the most confusion.

For example, after being pricked by the spines of a sea urchin, a common marine-life injury, one DAN Member called for advice. “If I had been bitten by a blue-ringed octopus,” he stated, “I would have more information than I would know what to do with, but for this injury I need advice.”

With that in mind, let’s review some of the more common types of marine life injuries and their management.

Wound Care
Let’s begin with the basics of wound care. Any break in the skin, especially one deep enough to cause bleeding, can cause an infection. The marine environment can cause even simple wounds to become infected from relatively uncommon types of pathogens (i.e., viruses, microorganisms and other disease-causing substances) and, depending on the region of the cut and where in the world you may have incurred the injury, many wounds can become infected quickly.

Clean It Up …
Proper initial cleaning of any wound is essential. As a general rule to prevent crosscontamination, experts encourage medical staff to wash their hands for a full 15 seconds between contacts with patients. And for initial first aid for divers with skin break injuries, that’s a reasonable amount of time.

Here’s an easy-to-remember timing technique: wash your hands for as long as it takes to sing the “ABC” song or “Happy Birthday.” Try this yourself, and see just how long it takes to sing the songs.

Of course, larger wounds require a longer cleaning time; exactly how long will depend on the setting, possible contaminants, the size of the wound and the ability of the injured person to tolerate the cleaning. Sometimes having the injured persons clean the wound themselves can yield better results, but not always.

Remember, however, the thoroughness of the initial care greatly influences the likelihood of infection and final outcome of the injury.

Or Splint It and Get to EMS – ASAP
In spite of the importance of a good initial cleaning, some wound care is best left to professionals. Someone who is well-intentioned but inexperienced in cleaning the wound may aggravate more serious injuries. Some of the more difficult injuries to handle in the field include open fractures (bone that penetrates the skin) and vascular, tendon or nerve injuries. Plus, it requires sound judgment to decide when it is simply better to splint and transport rather than risk uncontrolled bleeding or a permanent neurological damage from a not-so-skillful cleaning.

Check for Shock
With any marine life injury, monitor the injured person for any signs of shock, allergic reaction (hives, itching, swelling) or anaphylaxis, which is a serious and potentially life-threatening allergic reaction.

In the event of anaphylactic shock, provide supplemental oxygen if possible and get immediate advanced life support and emergency medical services transport to the nearest medical facility.

Marine Stings

We frequently receive calls from individuals who experienced itching, burning and redness of the skin after a marine encounter of unknown origin. Usually the symptoms disappear after one to two days, but sometimes they abruptly return. This can occur anytime from two to five days after the initial encounter, and the recurring symptoms may be worse than they were initially.

According to DAN consultant Dr. Bruce Miller, board-certified dermatologist, dive medicine physician and diver, this is a "delayed hypersensitivity reaction," or reaction to a toxin. Unlike a systemic (whole body) allergic reaction, which may affect larger skin areas or other organs, the delayed reaction tends to remain confined to the injury site. "Once this delayed reaction occurs," Miller said, "topical hydrocortisone cream (which is often part of the usual initial treatment) may have little or no benefit. The recommendation is to be evaluated by a physician, because oral steroids may be required to treat the reaction."

Think of this delayed reaction as being similar to a very bad case of poison oak, Miller said: "Without proper treatment, the symptoms can persist for weeks or longer. It's important to seek evaluation by a physician to ensure no secondary infection exists from the skin breaks that can occur when the skin is scratched too vigorously."

Practice Avoidance When Possible

As we have all been told before, avoiding contact constitutes the best cure for marine life injuries. This is not always easy. Heavy surge, clumsy dive buddies, lessthan-neutral buoyancy and other factors can cause inadvertent contact.

Whatever the circumstance, the results are the same. Certifying agencies offer courses or workshops for buoyancy skills as well as marine life identification. This additional training not only helps someone avoid marine life injuries, but it greatly contributes to dive safety.

Buoyancy problems can easily lead to contact with marine life or other injury. A few reminders:

- Practice good buoyancy;
- Secure loose gear;
- In heavy surge, allow greater distance from marine life;
- Avoid grabbing mooring lines with an ungloved hand;
- Know where you are in relation to the dive site.

Coral Cuts, Abrasions & Sponges

Coral

Coral injuries can be painful and sometimes difficult to heal. Controlling bleeding is the first consideration – i.e., use direct pressure and elevate the injured part of the body. If the wound is significant, bleeding is difficult to control or the affected part is deformed (i.e., if the rescuer sees anything that might indicate a dislocation or fracture), then get professional medical care.

Clean the Area. With coral cuts and abrasions, if there are no complications and bleeding is controlled, make sure that a thorough cleaning is the next priority.

Proper cleaning is essential. Here are some recommended steps:

- **Clean the wound of fragments.** Very small fragments of coral can remain in the wound, prolonging the healing process and increasing the risk of infection. The best way to remove any fragments of coral is to irrigate the wound with sterile water or a saline solution. If none is

available, clean drinking water will do. A 20cc. syringe (without the needle) is an excellent way to flush the wound with enough pressure to remove particles.

- **Clean the wound with antibacterial soap.** Next, clean the wound further with antibacterial soap. This can be the same antibacterial soap you buy from the store and use at home. Mixing hydrogen peroxide with the water will further help disinfect the wound and aid the removal of fragments. Use gauze pads, fresh paper towels or a clean cloth for this next cleansing.
- **Use antibiotic cream.** After a thorough cleaning, apply a topical antibiotic cream (e.g., neomycin, bacitracin, polymyxin, etc.), then cover the wound with a sterile dressing and bandage. Pre-sized bandages out of the box are absolutely acceptable if you have an appropriate size. Change dressings daily or as soon as they become wet or soiled.

Sponges

An itching rash may develop within a few hours after contact with a sponge and is similar to the rash from contact with other mildly toxic marine animals.

It's assumed that a diver who has handled a sponge and develops a rash on the hands has been exposed to a toxic species. The reactions are usually mild and subside in a few days with little or no treatment. However, reactions can become quite severe, with pain and blistering.

- **Clean the wound.** The best treatment is to clean the area quickly by removing the pointed spicules of sponges. These are the hard, pointed calcareous or siliceous bodies that support the tissues of sponges and become imbedded in a diver's skin. To remove these spicules, use wide tape to lift the particles from the site. This is an alternative to shaving. Or carefully scrape the area with a credit card, tongue depressor or similar object.
- **Use antibiotic cream.** Once you are confident that the any remaining fragments are removed, apply a topical application of hydrocortisone cream. Monitor the injured person for any signs of shock, allergic reaction or anaphylaxis. Anyone assisting the injured person should use simple latex gloves. Found in most first aid kits, they will suffice in protecting against stings.

Stinging Creatures: Fire Coral & Hydroids

These marine creatures have nematocysts, or stinging cells, that inject venom when they come in contact with a body. The intensity of the sting varies with each species that administers the sting as well as the diver's sensitivity to the venom.

More and more divers have reported stinging injuries as a result of grasping mooring lines with ungloved hands. Rope fibers themselves can cause injury as well. From the reports DAN receives, however, most mooring line injuries appear consistent with a marine life envenomation.

Colonies of organisms eventually inhabit all man-made objects in the ocean, including mooring lines. It is not known with certainty exactly what organism inhabits the lines. Many authorities maintain that the most likely suspect is a member of the hydroid family, a class of coelenterates that also includes jellyfish.

- **Flush the injury site with vinegar.** The initial treatment for fire coral (profiled separately in "Incident Insights") and hydroid stings is the same: to neutralize the venom, use white vinegar. Do not use fresh water to flush the area: the change in salinity will cause any untriggered nematocysts to "fire," causing more envenomation.

  Continuously flushing the area with vinegar is ideal. Since most of us do not carry a gallon of vinegar in our dive bags, however, soaking gauze pads, paper towels or clean cloths with

vinegar and applying them to the injury site works well, too.

- **Remove pieces of the offending organism that remain.** Use forceps or tweezers to remove any large pieces of the organism that might still be on the skin. To remove any imbedded or small particles, apply shaving cream and shave the area with a safety razor. For alternatives to shaving, use tape or scrape the area with a rigid object like a credit card (see "Sponges").

Vinegar versus Alcohol

The agent that neutralizes nematocyst venom appears to be species-specific. With differences among the venoms, there's not a universal treatment. Some species respond better to isopropyl (rubbing) alcohol, while others are neutralized by vinegar. Discuss with local divers which solution works best with indigenous species, especially if you're traveling to an unfamiliar area.

It is probably a good idea to carry bottles of both alcohol and vinegar in your dive bag. Other treatments such as meat tenderizer (papain) or baking soda paste are controversial but still considered acceptable by some.

Proper buoyancy control, respect for the territory of marine creatures and attention to detail, such as wearing gloves when using a mooring line, can help a diver avoid contact with marine life. Simply covering your skin can also help: less area exposed means less skin at risk. (This works well with jellyfish and hydroids.) A thin Lycra diveskin is sufficient protection from these stinging organisms. Consider wearing a diveskin under your shortie to protect exposed arms and legs. This could mean the difference between an ideal vacation and one that's spoiled.

First Aid for Hazardous Marine Life Injuries

All divers should consider training in at least basic first aid. The DAN First Aid for Hazardous Marine Life Injuries course offers training for a wider range of marine life injuries. There are many textbooks and pocket-sized reference books available for handling such injuries, too. The DAN website (and many others) also offer information.

Your regular doctor, when called on to treat any marine injuries, may not be familiar with such injuries. Your doctor is welcome to contact the DAN Medical Information Line for consultation with dive medical professionals.

In an emergency, physicians can also reach the same dive medical professionals through the DAN Diving Emergency Hotline. Simple precautions and timely intervention can make a very real difference for an injured person.

Anaphylaxis: What About Epinephrine?

One reason many people first learn to scuba dive is so they can interact with and observe aquatic life. But this is also one of the reasons some are afraid to dive. The fact is that injuries caused by hazardous marine life are rare and usually the result of a diver's carelessness or a defensive reaction by the animal. Regardless of your technique and diving preferences, there's a risk that you will be stung, bitten or cut by an aquatic animal sometime in your diving career. It may be an event as small as a brush with a tentacle or as frightening – and exciting – as being scraped by the swoosh of a shark's side or tail.

Depending on the type of animal that caused the injury, the appropriate first aid differs. However, the critical basic life support (BLS) protocols of ensuring the airway, breathing and circulation (also known as the ABCs) are the first aid provider's primary considerations.

The warning signs and symptoms will vary with the marine animal that caused the injury or illness and

because an individual’s reaction to the injury or illness can vary. Individual factors include an individual’s age and health sensitivity to venom or injury as well as any allergic reactions that may occur. Divers may also be more susceptible if they have had prior exposure to the venom or toxin delivered by jellyfish or some spiny fishes.

Although it’s worthwhile noting that it’s rare, anaphylaxis can be a truly frightening event for the diver as well as that diver’s companions. Signs of anaphylaxis include difficulty breathing, irritability, a drop in blood pressure, swelling of the soft tissue of the mouth and upper airway and eventual unconsciousness.

In the event you or a fellow diver experiences the life-threatening process of hypersensitivity known as anaphylactic shock, you need to take immediate action. Injectable epinephrine, or adrenalin (e.g., the EpiPen), provides quick relief from the rigors of this extreme allergic reaction.

But there’s a catch: epinephrine is a prescription drug. Plus, divers require training to be able to recognize the symptoms of anaphylaxis. Getting an unnecessary dose of epinephrine can cause a dangerous rise in blood pressure and, in some individuals, can result in circulatory collapse and death.

A safer medication that is equally important to give is Benedryl(r) (diphenhydramine). This will block more of the total effects of the reaction. Available without a prescription, diphenhydramine is generally safer to use: you are less likely to harm someone if the assessment of anaphylaxis is incorrect.

If an individual with true anaphylaxis has been treated in the field, that person still needs to receive definitive medical care_ both medicines wear off and symptoms can rebound. Physicians can provide other medications that last longer and are more likely to keep symptoms from returning.