

EMERGENCY IN REMOTE LOCATIONS

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You plan to explore on a deep virgin wreck? Your dream is to discover a unique cave system deep in the jungle? You heard about a Blue Hole miles offshore and want to give it a try? Chances are you'll be diving in a remote location where emergency medical systems are more frequent and up-to-date than traffic lights in Himalaya.

Anybody involved in the early stage of an expedition had to answer a few questions first:

- Is the place I plan to go has the necessary infrastructure in case of emergency?
- What is an Emergency and what kind of emergency I may face?
- What do I need to bring in order to reasonably deal with any potential emergency?

In other words, how remote is remote and do we need a physician 24/7 with us?

Unfortunately, if you travel most of your time, you will sadly discover that quite a few medical facilities worldwide look like hangars during intensive bombings. Sometimes the medical staff is so busy that people run everywhere like if the news of Armageddon have just been broadcast.

So the first reaction would be to think: we have to be self-sufficient if an accident occurs. Unfortunately this is rarely possible. So let's try to find a compromise and let's start with proper planning.

Emergency planning includes several steps:

1. Assessing the risks

Any technical diver has been exposed to "What if" scenarios. For a remote exploration, the best option is to lock down all the team in a small room with only filthy sandwiches to eat until they come out with a comprehensive list of all the problems that could happen during the exploration, underwater and at the surface. You then have to review this list and remove what you can't really deal with (tropical hurricane, tribal riot, terrorist attack using the Ebola virus, etc.).

Realistic problems range from cuts and wounds to Decompression Illness. They can be caused by:

- The equipment we use (engine, propeller, ropes, etc.),
- The dive we plan to do (dive profile, number of dives per day, number of days diving, etc),
- The environment where we dive (offshore reef or wreck, overhead environment, etc),
- The location of the expedition (tropical climate, local food, etc).

2. Evaluating the available resources

Wherever you dive, even in the most remote locations, there are always some resources you didn't think about. As many things in technical diving, it all comes to using what is available and be creative.

In case of an accident, you need:

- **People to handle the emergency.**

The best guy for the job is YOU. The fact that you actually plan for any potential accident makes you the perfect choice. But all the team should be involved. A simulated emergency scenario could be run during a pre-expedition training session, or even better on the first day of the expedition.

Consider taking training courses to better deal with an accident. Obvious choice is a technical rescue course, but it's not common thing. You can sign up for a CPR/first aid course, O2 provider course or even better, a DMT course (Diver Medic Technician, see references at the end of this article).

Prepare some procedures (rescue, evacuation, etc) and make sure everyone knows them.

Never forget local medical staff (Navy, Search & Rescue team) that can be ready to help even recreational divers.

- **Specific equipment.**

The first things people think about are First aid kit and Oxygen kit. A complete First Aid kit is maybe the most important piece of equipment to bring along with you in a remote location, as the most common accidents are not diving-related but rather equipment/location-related (cut, wound, burn, food poisoning, etc). Regarding Oxygen administration, Deco tanks often replace specific Oxygen kits, as long as they have an appropriate regulator for conscious AND unconscious patients. Closed-Circuit Rebreathers can also been used when nothing else is available.

Technical divers who don't have two left hands with ten thumbs can easily build other equipment like stretcher, deco station or habitat out of garbage and junkyard stuff.

Except for the most gifted ones, recompression chambers are seldom part of an expedition, and the team has most of the time to rely on local facilities. A pre-dive visit is always a good idea in order to inform the medical staff and to organize the most efficient evacuation and treatment.

3. Evaluating the additional needs

As we said, basic First-aid trained people can efficiently handle most of the accidents a diving team would have to deal with.

However, most of the divers will be unable to treat more severe injuries, except if Harry Potter has initially trained them.

The best choice is obviously to have a Hyperbaric Physician participating in the expedition, either as a diver or as a member of the surface support team. A physician becomes quite handy when it comes to on-site treatment of an injury or a diving-related condition.

If your expedition is so remote and the dive profiles really over-the-edge, it might become necessary to consider a portable recompression chamber. It's obviously the tool of choice if a Decompression Illness occurs and you are so far away from the nearest recompression chamber that you would have to hire a Space Shuttle to go there.

But a portable chamber (even a foldable one) is big and requires some thorough preparation to transport it. It is also quite an investment and renting one might be the most affordable option. Some models can be easily folded and don't need a huge amount of gas to be operated. However the best chamber is useless if you don't have the proper people to operate it. And don't forget that this kind of chambers is mainly for evacuation purpose, so you obviously need to have the adequate transportation.



The best option but sometimes too far away!

You might also need some communication tools as well. Calling for help in remote locations sometimes means using Satellite phones, Long Range radio transmitter, or emergency radio beacon (EPIRB). Technology goes fast and what would have been extremely pricey a few years back could be an affordable option nowadays.

4. Setting up emergency procedures

As we said, quite a lot of problems can happen when you're in a remote location. However many small injuries can easily be treated on site. No need to ask for a helicopter and a M.A.S.H-like medical team if one of the divers has a small cut or a big hangover.

Therefore only four main emergency procedures should really be considered:

- **A missing diver.** In this kind of difficult situation, the first step might be to determine if we're dealing with a diver) or a team of divers) lost at the surface or underwater. Being lost at the surface most of the time means a long wait and an extensive search pattern in a rough sea (there would be no fun if this happens with a calm sea and a perfect weather!). Being lost underwater rather means a strong current and no SMB deployed, or worse, an unconscious diver to be rescued. The emergency procedures and the related training pretty much depend on the location you'll be diving. Being lost in a cave deep in the jungle or drifting at the surface by night is not exactly the same kind of situation.

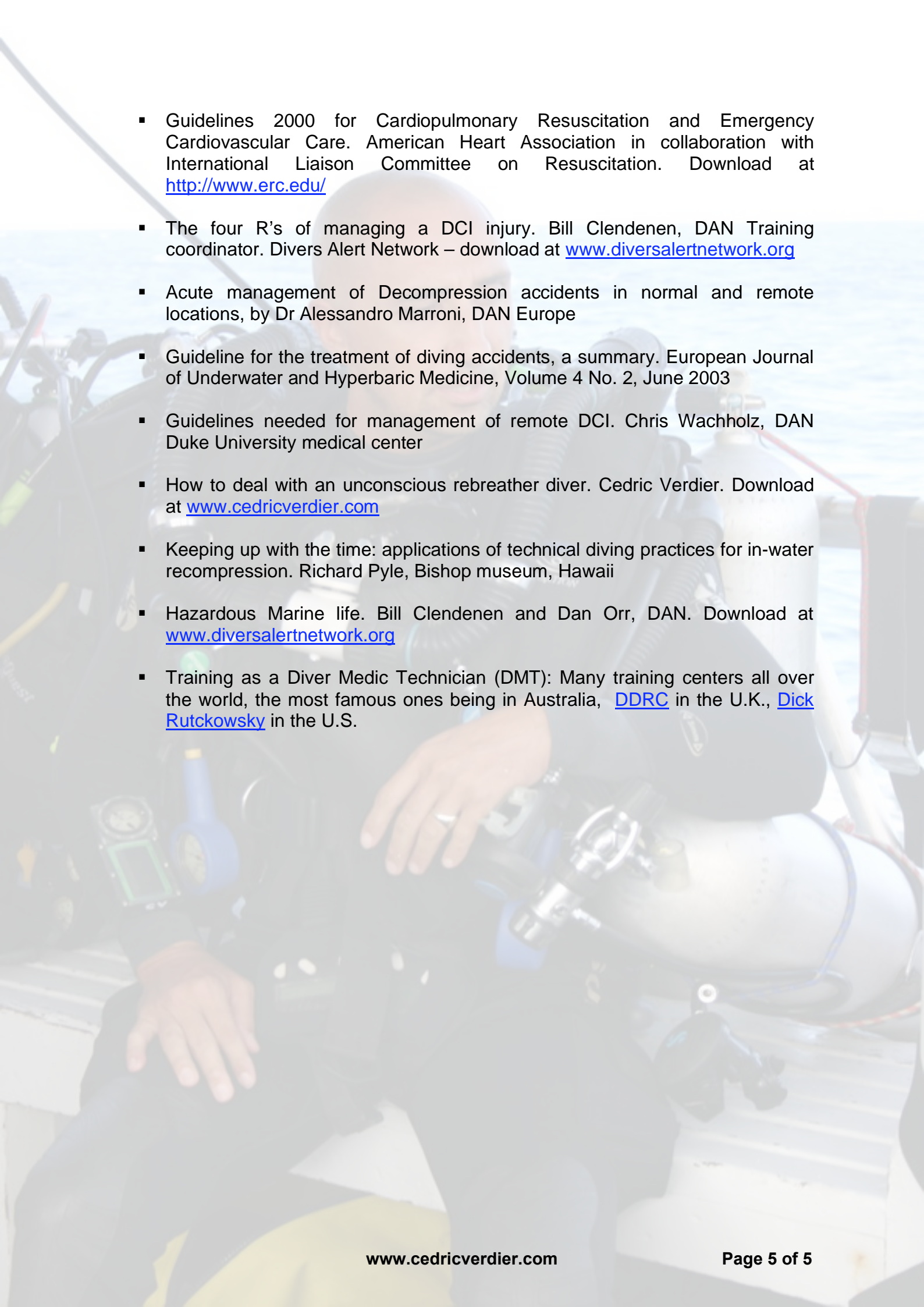
- **An unconscious diver.** Here's no magic! Rescuing an unconscious diver underwater has nothing to do with pure luck or imagination. Some of the techniques are simply too complex to be invented on-site with a high level of stress. Only properly trained divers can do a proper rescue. Read some of the articles cited in reference and practice, practice, practice.
- **A Decompression Illness.** Tolls are of paramount importance when divers get bent. But oxygen, fluids and drugs are just tools. Some divers in very remote locations might also consider proper In-Water Recompression procedures, if such things do exist. IWR is obviously not the best way to treat a diver, but it looks like it saved some lives in the past. Some remote expeditions included the techniques and the related tools (Full-Face mask, Deco seat, etc) in their emergency procedures. Some IWR protocols are cited in reference at the end of this article.
- **An urgent evacuation.** No need to attempt a surgical operation when you have only a spoon and a Swiss army knife and when your training is mainly based on what you remember from "Survivor" on TV. When you're dealing with severe injuries, DCI or life-threatening conditions, you must have planned fast evacuation procedures beforehand. You can't improvise a fast transportation and a smooth evacuation when every minute counts.



Fast transportation, another perspective !

References

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 - Keeping up with the time: applications of technical diving practices for in-water recompression. Richard Pyle, Bishop museum, Hawaii
 - Hazardous Marine life. Bill Clendenen and Dan Orr, DAN. Download at www.diversalertnetwork.org
 - Training as a Diver Medic Technician (DMT): Many training centers all over the world, the most famous ones being in Australia, [DDRC](#) in the U.K., [Dick Rutckowsky](#) in the U.S.