

Why Divers Die

Part II— the physical demands of the diving

On occasion we choose to report on diver's deaths. Because we're a newsletter for serious divers, we feel it's in our subscribers' best interest to publicize case studies of dive deaths periodically so that we can all avoid repeating the errors that were made.

There were only 85 dive deaths in 1996, down from the previous year and down significantly from highs during the mid-1970s. Most cases cited in this article come from the 1995-96 Diver's Alert Network case studies, with cases from other nations added occasionally. All editing and commentary are solely ours.

Last month we discussed deaths from entrapment and entanglement, both major causes of dive deaths. But many dive deaths are caused by the diver's preexisting health problems which have been aggravated by the physical demands of the dive.

Not that tropical diving necessarily *seems* demanding.... You get a ride to your boat, have someone help you with your tank, fall over the edge of the boat, tour the Cayman Wall, have your tank lifted up before you climb back on the boat, and go home. It certainly doesn't require a diver to be fit, that's for sure. Probably because diving is so user-friendly, cardiovascular disease is a major cause of diving death.

But diving causes exertion. And as it's written in the 1997 DAN fatality report, "exertion

increases the cardiac output and the need for oxygen by the heart muscle. If the vessels supplying blood, and ultimately oxygen, to the heart are narrowed by atherosclerosis, the result can be death of the tissue, and, potentially, a short circuit in the electrical conduction of the heartbeat."

These are a few cases from the DAN file where cardiovascular disease, often unknown, played a role in a diver's death.

A very experienced, 56-year-old male dive instructor made a dive to 75 feet for 40 minutes

Probably because diving is so user-friendly, cardiovascular disease is a major cause of diving death.

with a buddy, then surfaced and began to swim back to the boat. During the swim, the divers became separated, and the decedent was found floating near the stern in full cardiopulmonary arrest. . . . But had the diver paid attention to his own body, he might be alive today: he had experienced an episode of fibrillation — irregular heartbeat — a week earlier, and the autopsy later revealed extensive cardiovascular disease.

A 40-year-old female with fewer than 20 lifetime dives made a 66-foot dive for 20 minutes. She was low on air and surfaced, then began to struggle and complained of having difficulty breathing. The other divers came to her aid, but she was unresponsive. The autopsy revealed extensive hardening of the heart tissue.

Shortness of breath? Fatigue? Listen to your body.

A very experienced, 51-year-old male dived while his wife waited in the boat. He had a history of hypertension. After diving in a strong current, he came alongside the boat and told his wife that he was having difficulty breathing and was very fatigued. She attempted to get a rope to him, but he quickly sank beneath the surface. The body was recovered one week later; an autopsy showed severe coronary artery disease.

Heart problems aren't restricted to older divers. A 27-year-old obese male had 15 lifetime dives, but hadn't made a dive in nearly two years. He and three friends made a 30-minute, 30-foot shore entry dive. He then complained of heartburn and fatigue. Still, he made a second dive, during which he became separated from the other divers, called for help on the surface, and then lost consciousness. Resuscitation efforts were unsuccessful.... Had he listened to his symptoms and refrained from diving, would he be alive today?

As DAN notes, cardiovascular disease can be clinically

silent, and the first symptom may be sudden cardiac death. As a potentially strenuous activity, diving requires an adequate level of physical and cardiovascular fitness. An intelligent diver will follow a healthy diet, regularly engage in aerobic exercise, and obtain periodic medical evaluations. Older individuals should have a thorough physical exami-

nation with appropriate assessment of their cardiovascular status. An electrocardiogram and exercise treadmill test should be strongly encouraged.

While DCS is the most common crippling accident that happens to divers, it's usually not a killer—unless, of course, you do something really stupid. A 32-year-old, moderately-

experienced diver made a dive to 276 feet on air to explore a wreck. His regulator was free-flowing, which caused him to run out of air before any decompression obligation could be met. He went directly to the surface after a 14-minute bottom time, and he immediately radioed for help but then became paralyzed and lost

What Are We Doing to Our Reefs?

For more than a decade, divers worldwide have reported rapidly increasing damage to reefs, but there has been little scientific data supporting their observations. Now, thanks to 750 volunteer divers and 100 marine biologists, Gregor Hodgson, coordinator of Reef Check, says "we have evidence that coral reefs are being plundered on a global basis."

In fact, Reef Check, the first global survey of reefs ever made, has found that 95 percent of the world's coral reefs have been damaged by overfishing, dynamiting, poisoning, pollution, or ships' anchors.

The Reef Check survey, which was sponsored by the Marine Conservation Society, was carried out last summer at 300 sites in the Caribbean, the Indo-Pacific, and the Red Sea. It revealed that populations of fish and shellfish once common to the reefs it studied have been decimated on most of them. On each reef studied, teams examined an area of coral roughly the length of a football pitch. They checked numbers of 20 key species and looked for evidence of coral damage from sewage pollution, cyanide fishing, and anchor destruction.

The most severely affected reefs were in the Indo-Pacific, where demand for reef fish — a gourmet delicacy in Hong Kong and southern China— has stripped reefs of many large species. The Napoleon or humphead wrasse and Barramundi cod were once moderately abundant on Indo-Pacific reefs, but none were reported at 85% of the 179 reefs surveyed in the region. Although more than 25 kilometers of Indo-Pacific reef were surveyed, only 26 humphead wrasse were seen. Cyanide and other forms of fishing had severely damaged populations of this species, which was formerly found in moderate abundance there. (Areas in the Maldives and the Red Sea, where there was no fishing with poisons or explosives, had bigger fish populations.)

Lobsters were also scarce in the region. Only 25 were found in the 179 Indo-Pacific reefs surveyed, 11 of them at a single reef in an Indonesian marine reserve. In all, the Indonesian Institute of Science found that 42% of Indonesian coral reefs have been damaged and that only 6% are in excellent condition.

Sadly, worldwide statistics aren't a whole lot better. No lobsters were found at 81 percent of the reefs surveyed worldwide, and 40 percent of reefs had no grouper longer than a foot. Large grouper are heavily fished world round, and none were reported at 40% of the reefs studied. The rest had small numbers at best. (The Maldives and the Red Sea, where no poisoning or dynamiting occurs, were also an exception to this trend. More than 20 large grouper were recorded at survey sites in these areas.) Out of 51 Caribbean reefs surveyed, the once-common Nassau grouper was found at only four sites, and the total count was only 12 fish. In the Seychelles, Dr. Elizabeth Wood noted that "we found no lobsters on the sites we surveyed, and valuable shells such as giant triton have also been over-collected -- we found none of these either."

"Coral reefs on a global basis have been pretty well wiped out as far as these high-value edible species go," says Hodgson. "The results are very shocking."

If there is any positive side to the study results, it is that this sort of information is vital if countries are to be convinced to protect their reefs before it is too late. Says Herman Cesar of the World Bank's Coral Reef Rehabilitation Program, "the Indonesian government does not realize that if coral reefs are destroyed, the value of Indonesian reefs, which can generate 2.3 billion dollars in annual income, would diminish seriously." However, it's just this kind of information that has led the Philippines to set up a legal system which makes it easier to bring violators to court. As a result, Cesar said, cyanide fishing there has decreased significantly.

— from various news sources, including *New Scientist*
Next issue: What YOU can do to help save the reefs.

consciousness. He spent several days in a hyperbaric chamber before developing pulmonary complications and dying three weeks later.

Embolism, however, does claim many divers, at least seven in 1996. This 38-year-old novice made a shore entry into a rip current and spent only five minutes at 10 feet before becoming anxious and surfacing. He became unconscious and was helped to shore by his dive buddies. Cardiopulmonary resuscitation was unsuccessful.

Such a case brings to mind the upwellings one can find in serious current diving, even in Cozumel. If the current pulls you up, don't hold your breath out of surprise. Here is evidence that ten feet is enough to kill you.

Another case shows precisely why a tropical diver who decides to try a cold water wetsuit dive had damn well better get training. This 54-year-old female certified diver with approximately 60 lifetime dives was using a drysuit with which she had no experience. During the second dive, she had significant buoyancy problems, inverted her body, then made an ascent to the surface where she struggled and would not accept assistance. She lost consciousness. Resuscitation couldn't revive her.

In 1995, a 52-year-old experienced male diver was making a deep dive using trimix (oxygen, nitrogen, helium). He had a problem with his drysuit before the dive so he shut off the automatic dump. During descent, his buddies stopped at 250 feet, but he continued down to 307 feet.

Witnesses saw him pop to the surface and resubmerge as his buddies made their decompression stops. His body was recovered an hour later.

And there is always someone trained as an open water diver who thinks he's capable of taking anyone diving. Here, a guy took his 32-year-old uncertified girlfriend diving to 60 feet. He had equipment problems and became separated from his girlfriend, who he found on the surface 25 minutes later without her equipment. She died two days later, apparently from an embolism. An examination of the equipment revealed a malfunctioning and incorrectly-rigged buoyancy compensator and a tank that was out of certification.

Next issue: more cases

Benefit From the Asian Money Crisis?

For dive travelers is it bargain or bedlam or both?

Last summer Asian currencies went into freefall, with the Malaysian ringgit and the Thai baht each falling about 50% and the Indonesian rupiah declining about 70%. Even the Australian dollar fell to an 11-year low, losing about 20% of its value against the U.S. dollar. Naturally, my immediate response was to plan a dive trip to take advantage of these bargain exchange rates. Then I thought about it more carefully.

Others must have reconsidered as well: in Indonesia, tourist arrivals for the first two

months of this year fell 12.1% from last year. According to Reuters, East Asia and the Pacific region suffered their worst-ever tourist season. Even Australia is predicting no growth in tourism in 1998.

So why is what sounded like a travel bargain turning out to be a travel bust? Before the current crisis, Asian economies were growing rapidly and gearing up for a great tourist influx. New tourist-related construction broke ground, new airlines were launched, and established airlines embarked

on costly modernization programs.

After the floatation of the Thai baht last July, however, the castles in the air fell with a great thud, and the values of Pacific currencies toppled. Experts predict that economic recovery will take two to five years, with countries that were especially hard-hit, such as Indonesia and Thailand, possibly taking even longer.

Where does all this leave the travel industry? Somewhere between the proverbial rock and hard place, by most accounts.