



Louisiana State University  
**Agricultural Center**  
 Louisiana Cooperative Extension Service



**LOUISIANA  
 SEA GRANT**  
 College Program

CIRCULATING COPY  
 Sea Grant Depository



2/28/1993

## SCUBA SAFETY

Louisiana's coastal and marine environments present exciting opportunities for recreational scuba diving. Underneath offshore oil rigs, fish and other marine life flourish, providing the perfect environment for both the spearfisher and the underwater photographer. Louisiana's freshwater lakes and rivers can also provide great diving opportunities.

Successful diving, however, requires strict adherence to certain safety procedures. To avoid injury, it's critical for the diver to learn these precautions and observe them carefully. The following tips can help the beginning diver to experience a safe and enjoyable dive.

**The buddy system.** A major factor in diving safety is having a diving partner, or buddy. The buddy can provide help when suiting up or checking equipment and when a partner is in trouble underwater. Diving partners are responsible for each other. *For greatest safety, always dive in pairs.*

**Before you dive.** Note wind, sea, current, and tide conditions. Observe boat activity, piers, and structures. Don't dive if conditions are unfavorable. Check all equipment and plan the dive with your buddy. Universal hand signals are used underwater to communicate common messages; learn these and work them out in advance with your buddy. Display the diving flag (a red rectangular pennant with a white diagonal stripe) when going underwater.

**Avoiding underwater injury.** So long as a diver does not start thrashing around and drawing attention to himself, sharks and other fish will normally just swim harmlessly by. The most common injuries occurring from underwater plant and animal life are puncture wounds from sea urchins, fish spines, and rays; stings from jellyfish and corals; and cuts and scrapes from rocks, barnacles, and crabs. A good rule to remember is: If you don't know what something is, don't touch it, and keep your hands out of cracks and crevices.

**The bends.** The bends occur whenever someone who is breathing compressed air underwater rises to the surface without allowing enough time for excess nitrogen to escape from his body. The nitrogen comes from the compressed air the diver breathes. The longer the diver remains underwater, the more time the body has to absorb oxygen. Also, the deeper the diver goes, the greater the absorption rate of nitrogen into the body.

The bends cause an intense pain or dull ache, usually around the body's joints. Other effects of the bends are nausea, dizziness, disorientation, and unconsciousness. A tiny nitrogen bubble, which would have been purged from a diver's bloodstream by decompression stops, can form in the spinal cord and paralyze a diver.

To get rid of excess nitrogen, the diver must stop at predetermined depths for a specific amount of time during the ascent. The stops will provide an adequate amount of decompression time. The number of stops a diver should take is calculated by a diving

table. Getting the bends can be avoided by following the diving table and decompressing times.

**Air embolisms.** When a diver surfaces too quickly, the compressed air can tear the small air sacs in the lungs. This allows air bubbles into the blood, which in the worst case can cause a stroke-like condition.

Air embolisms can occur in water as shallow as four feet. They can even be caused by burping while diving. To avoid embolisms, always exhale, don't panic, and don't extend your capability while underwater.

Divers with air embolisms should be given oxygen as soon as possible and should drink plenty of fluids. Keeping a diver's head lower than his feet helps to prevent air bubbles from collecting in the head.

**Other decompression sicknesses.** Sport divers who make frequent deep dives of short duration are subject to spinal cord injuries called "hits," which are blockages of blood seving the central nervous system. "Chokes," another decompression sickness, has caused post-dive deaths by clogging blood vessels to the lungs with frothy bubbles. All forms of decompression sickness occur when divers who have been breathing pressurized air underwater surface too quickly.

Divers who habitually practice inadequate decompression techniques run the risk of contracting bone necrosis or "bone rot"--even if they experience no pain or other decompression sickness symptoms. Bone necrosis is the death of bone tissue caused by gas bubbles forming within the bone capillaries. The bubbles obstruct blood flow and stop the oxygen supply to bone tissue. The condition can progress undetected for several years, or rapidly cause pain and limitation of movement.

*The key to preventing all decompression sickness is to faithfully follow the decompression tables.*

**Alcohol and smoking.** Never consume alcohol or narcotics before diving. Drugs affect the body differently underwater where pressure is increased and may make the diver more prone to decompression sickness and other physical problems. Smoking damages the heart and lungs--the organs most stressed by diving. Divers who smoke should refrain from smoking for at least one hour before a dive, in order to mitigate some of the acute effects of smoking.

A cold is especially serious for a smoking diver because it obstructs small airways and traps air. This may induce lung rupture when the diver is ascending. Smoking divers should use a conservative approach to the dive tables and a slower than standard ascent.

**Diving and pregnancy.** Just as there is a transmission of drugs during pregnancy from the mother to the child, there is also the transmission of gases. As a diver descends, pressures of the gases she breathes increase and the concentrations of oxygen and nitrogen in the blood increase. When she ascends, bubbles can form in both her circulatory tract and that of the baby; even though the mother may come up safely, it does not follow that the baby will also. For this reason, it is not wise for a pregnant woman to dive.

