

DIVING WITH HEART DISEASE

Most people diagnosed with heart disease do not feel like diving or are advised by their physicians not to dive. However, some individuals with known heart disease may be able to dive safely if their condition is being treated and their exercise capacity is satisfactory. It is essential that such individuals have a thorough review of their fitness at least once a year, as well as any time their health status or treatment regimen change.

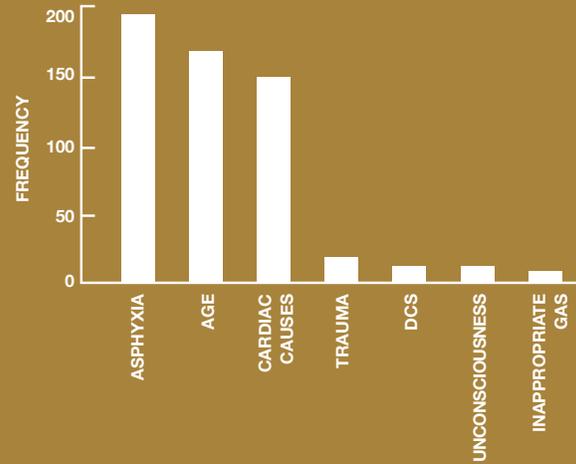
Divers with no known history of heart disease may develop a cardiac condition over time and experience a disabling heart attack as the first manifestation of that condition. Not much can be done to prevent such a scenario. With aging, the risk of developing heart disease increases. Thus, it is recommended that older divers have preventive medical examinations more frequently.

If you remember just one fact, it should be that 60 percent of divers who died due to a heart problem while diving experienced warning signs before the dive but went diving anyway.

Common warning signs, according to the American Heart Association, are:

- ▮ **CHEST DISCOMFORT.** Most heart attacks involve discomfort in the center of the chest that lasts for more than a few minutes or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness or pain.
- ▮ **DISCOMFORT OR PAIN** in one or both arms or the back, neck, jaw or stomach.
- ▮ **SHORTNESS OF BREATH**, with or without chest discomfort.
- ▮ **ONSET OF A COLD SWEAT**, nausea or lightheadedness.

MOST COMMON CAUSES OF SCUBA FATALITIES



Heart disease in the United States is responsible for:

- ▮ 1 in every 4 deaths.
- ▮ 1 heart attack every 34 seconds.
- ▮ 1 death every minute.

A sudden cardiac death that occurs during a dive may be associated with the dive in these ways:

- ▮ Unrelated to the dive; its occurrence during a dive was coincidental.
- ▮ Due to acute myocardial ischemia (an inadequate supply of blood to the heart), triggered by exercise in an individual with reduced exercise tolerance.
- ▮ Due to arrhythmia (a disturbance in the heart's rhythm), triggered by immersion in an individual with a pre-existing rhythm anomaly or structural disorder.
- ▮ Caused by immersion pulmonary edema (an accumulation of fluid in the tissues of the lungs).

Factors that may increase the risk of SCD while diving include:

- ▮ Immersion and cold.
- ▮ Overexertion, often due to swimming against a current or in conditions of excessive buoyancy variance.
- ▮ Negative pressure breathing, due to the use of a faulty regulator.
- ▮ Emotional stress, often due to an unexpectedly perilous dive.

For more information, explore DAN.org/HEALTH.



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ADDITIONAL READING

“Cardiovascular health” by Petar Denoble. Alert Diver Online.
Alertdiver.com/Cardiovascular_Health

“Matters of the heart” by Petar Denoble. Alert Diver Online.
Alertdiver.com/Matters_of_the_Heart

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HEALTH & DIVING REFERENCE SERIES

THE HEART & DIVING: IDENTIFYING POTENTIAL RISKS





THE RISK OF SUDDEN CARDIAC DEATH WHILE SCUBA DIVING

Sudden cardiac death (SCD) is the term for a death that occurs shortly after an acute cardiac disorder—such as a heart attack (also known as a myocardial infarction), sudden cardiac arrest (a cessation of the heart’s beating action), or immersion pulmonary edema (an accumulation of fluid in the tissues of the lungs). SCD sometimes occurs in individuals who were previously diagnosed with heart disease or who experienced warning symptoms, but sometimes it occurs in individuals with no history of heart disease. Nevertheless, SCD is usually related to some existing irregularity, even if it was unrecognized—such as a structural defect in the heart, a flaw in the electrical system that regulates the heartbeat, or an abnormal response to stress.

The health of your heart and circulatory system is essential to your safety while scuba diving. Most individuals who plan to take up diving are screened for heart disease before they enroll in a training program and, if they are obviously unfit, are counseled not to dive. However, some conditions may escape detection and others can develop over time with no warning. For some individuals, the first sign of disease may be a heart attack or symptoms of an impending attack. Divers should be familiar with the manifestations of, and risk factors for, heart disease and should do their best to avoid or control them.

The risk of death while diving increases with age. It is as much as five times higher for older divers than for divers in their 20s.

RISK FACTORS FOR HEART DISEASE

The primary risk factors for heart disease are hypertension (high blood pressure), hyperlipidemia (high levels in the blood of fats, especially LDL cholesterol), and smoking. About half of Americans (49%) have at least one of these three risk factors.

These percentages of all deaths caused by cardiovascular disease can be attributed to the following risk factors:

- 1 **HYPERTENSION: 13%**
- 2 **TOBACCO USE: 9%**
- 3 **HIGH BLOOD SUGAR: 6%**
- 4 **PHYSICAL INACTIVITY: 6%**
- 5 **OVERWEIGHT AND OBESITY: 5%**



PREVENTING DEATH WHILE DIVING

Check your risk factors by completing the RSTC (Recreational Scuba Training Council) Medical Statement. If you do not know your blood pressure or lipid levels, you are at risk. Get them measured!

HYPERTENSION

Hypertension also contributes to a high percentage of cardiac deaths. It may lead to left ventricular hypertrophy (a thickening and weakening of the muscle tissue in the chamber that is your heart’s primary pump) or rhythm disturbances, thus elevating your risk of stroke, heart attack and kidney failure. The upper number of your blood pressure ratio—known as systolic pressure—should be below 120 millimeters of mercury (mmHg); every mmHg above 120 in that value raises your risk of premature death.

SMOKING

Smoking is the single most deadly risk factor. It increases your risk of coronary heart disease, erectile dysfunction, peripheral vascular disease, stroke, SCD and cancer. Smoking affects your breathing, blood oxygen content and exercise tolerance. It increases your blood pressure and lipid levels and can result in sustained, low-level inflammation that causes your cardiovascular system to deteriorate.

CHOLESTEROL

Abnormal levels of lipids in your blood may as much as double your 10-year risk of dying. Make sure your lipid levels have been tested, and take steps to control them if necessary. Aim to maintain a total cholesterol of 200 mg/dL (milligrams per deciliter of blood) or less, an LDL (“bad cholesterol”) of 100 mg/dL or less, and an HDL (“good cholesterol”) of 50 mg/dL or more. And be sure to take as recommended any cholesterol-lowering medication prescribed by your doctor.

INACTIVITY

Inactive people are twice as likely to develop heart disease as active people. Regular exercise helps to maintain both health and a capacity for sustained exercise; it also slows the decline in exercise capacity that is an unavoidable part of aging. To maintain health, you should exercise at least 30 minutes a day, five times a week. To increase your exercise capacity, exercise more often and more vigorously. If you are currently sedentary, evaluate your risk factors and consult your physician before you start exercising.

OBESITY

Obesity is often associated with a lack of exercise. Abdominal obesity (a waist circumference of 40 inches or more for men and 35 inches or more for women) carries the greatest risk. Obesity can lead to increased blood pressure, blood glucose and lipid levels and result in a condition known as metabolic syndrome. Obese divers may also have difficulty with buoyancy control and may need to exert themselves more while diving, thus putting extra strain on their heart.

DIABETES

Diabetes can often be prevented by a healthy diet and lifestyle. If you have diabetes, make sure to adhere to the regimen that your doctor prescribes. If any changes are made to your prescribed treatment, you must allow for a period of stabilization before you return to diving. It is also important that you regularly check your cardiovascular health and exercise capacity.