

477e-8 life-threatening, and spinal cord involvement frequently results in permanent disability. Latency is variable. Serious DCS usually manifests within minutes of surfacing, but mild symptoms may not appear for several hours. Symptoms arising more than 24 h after diving are very unlikely to be DCS. The presentation may be confusing and nonspecific, and there are as yet no useful diagnostic investigations. Diagnosis is based on integration of findings from examination of the dive profile, the nature and temporal relationship of symptoms, and the clinical examination. Some DCS presentations may be difficult to separate from CAGE following pulmonary barotrauma, but from a clinical perspective the distinction is unimportant because the first aid and definitive management of both conditions are the same.

TREATMENT DIVING MEDICINE

First aid includes horizontal positioning (especially if there are cerebral manifestations), intravenous fluids if available, and sustained 100% oxygen administration. The latter accelerates inert gas wash-out from tissues and promotes resolution of bubbles. Definitive treatment of DCS or CAGE with recompression and hyperbaric oxygen is justified in most instances, although some mild or marginal DCS cases may be managed with first aid measures, an option that may be invoked under various circumstances, but especially if evacuation for recompression is hazardous or extremely difficult.

Long-distance evacuations are usually undertaken using a helicopter flying at low altitude or a fixed wing air ambulance pressurized to 1 atmosphere pressure.

Recompression reduces bubble volume in accordance with Boyle's law and increases the inert gas partial pressure difference between a bubble and surrounding tissue. At the same time, oxygen administration markedly increases the inert gas partial pressure difference between alveoli and tissue. The net effect is to significantly increase the rate of inert gas diffusion from bubble to tissue and tissue to blood, thus accelerating bubble resolution. Hyperbaric oxygen also helps oxygenate compromised tissues and appears to ameliorate some of the proinflammatory effects of bubbles. Various recompression protocols have been advocated, but there are no data that define the optimum approach. It typically begins with oxygen administered at 2.8 atmospheres absolute, the maximum pressure at which the risk of oxygen toxicity remains acceptable in a hyperbaric chamber. There follows a stepwise decompression over variable periods adjusted to symptom response. The most widely used algorithm is the U.S. Navy Table 6, whose shortest format lasts 4 h and 45 min. Typically, shorter "follow-up" recompressions are repeated daily while symptoms persist and appear responsive to treatment. Adjuncts to recompression include intravenous fluids and other supportive care as necessary. Occasionally, very sick divers require high-level intensive care.