

FIRST AID FOR DIVING EMERGENCIES DOES THE DIAGNOSIS MATTER?

Michael Davis

Key Words

Accidents, flowchart, first aid.

In accordance with Murphy's Law diving emergencies develop out of the blue when least expected and usually at the worst possible moment. They are invariably the result of a chain reaction of circumstances that breaks through the loose-knit but nevertheless effective safeguards built into scuba diving and are rarely caused by any one factor alone.

This is a harrowing moment for a group of divers faced with sudden chaos and a motley of non-specific symptoms and signs in the victim (Table 1).

The circumstances may provide sufficient clues to what is happening (e.g. oxygen toxicity is hardly likely in someone in difficulties on the surface before an air dive, but near drowning is a strong bet).

I believe that precise disease diagnosis is largely irrelevant to the institution of appropriate First Aid.

The approach to First Aid teaching must either be based on an in-depth study of each medical condition, or be a pragmatic one that presents a sequence of simple decisions and actions, a treatment algorithm, that provides immediate care for all potentially life-threatening conditions, while medical aid is sought.

This approach is clearly illustrated in the modern teaching of Basic Life Support. It must also be emphasised that the actions of those at the accident scene largely determine the outcome for the injured diver.

This is not to say that the triad of Resuscitation, Disease Diagnosis and Treatment do not go hand-in-hand in dealing with medical emergencies. I simply consider that it is unproductive to teach this process to most recreational divers. Indeed, evidence from case referrals to the Christchurch Hyperbaric Unit suggests that the wet suited mini-doctor sometimes does his fellow diving victim a disservice.

The old adage that *a little learning is a dangerous thing* should not be forgotten!

TABLE 1

THE POSSIBLE PRESENCE OR ABSENCE OF 15 SYMPTOMS AND SIGNS IN 8 POTENTIALLY SERIOUS DIVING-RELATED CONDITIONS

Note that there is not a single condition or presentation combination that is diagnostic

Common signs and symptoms	DCI	Pneumothorax	Ear barotrauma	Marine sting	Near drowning	Hypothermia	Myocardial infarction	Trauma
Pain								
Limb	+	-	-	+	-	+	+	+
Chest	+	+	-	+	+	-	+	+
Headache	+	+	+	+	+	+	+	+
Fatigue	+	+	+	+	+	+	+	+
Shivering	+	+	+	+	+	+/-	+	+
Nausea and vomiting	+	+	+	+	+	+	+	+
Shortness of breath	+	+	-	+	+	+	+	+
Cyanosis	+	+	-	+	+	+	+	+
Tinnitus	+	-	+	-	-	-	-	+
Motor loss	+	-	-	+	-	-	+	+
Sensory loss	+	-	-	+	-	-	+	+
Convulsion	+	+	-	+	+	-	+	+
Loss of consciousness	+	+	+	+	+	+	+	+
Signs of shock	+	+	-	+	+	+	+	+
Cardiorespiratory arrest	+	+	-	+	+	+	+	+

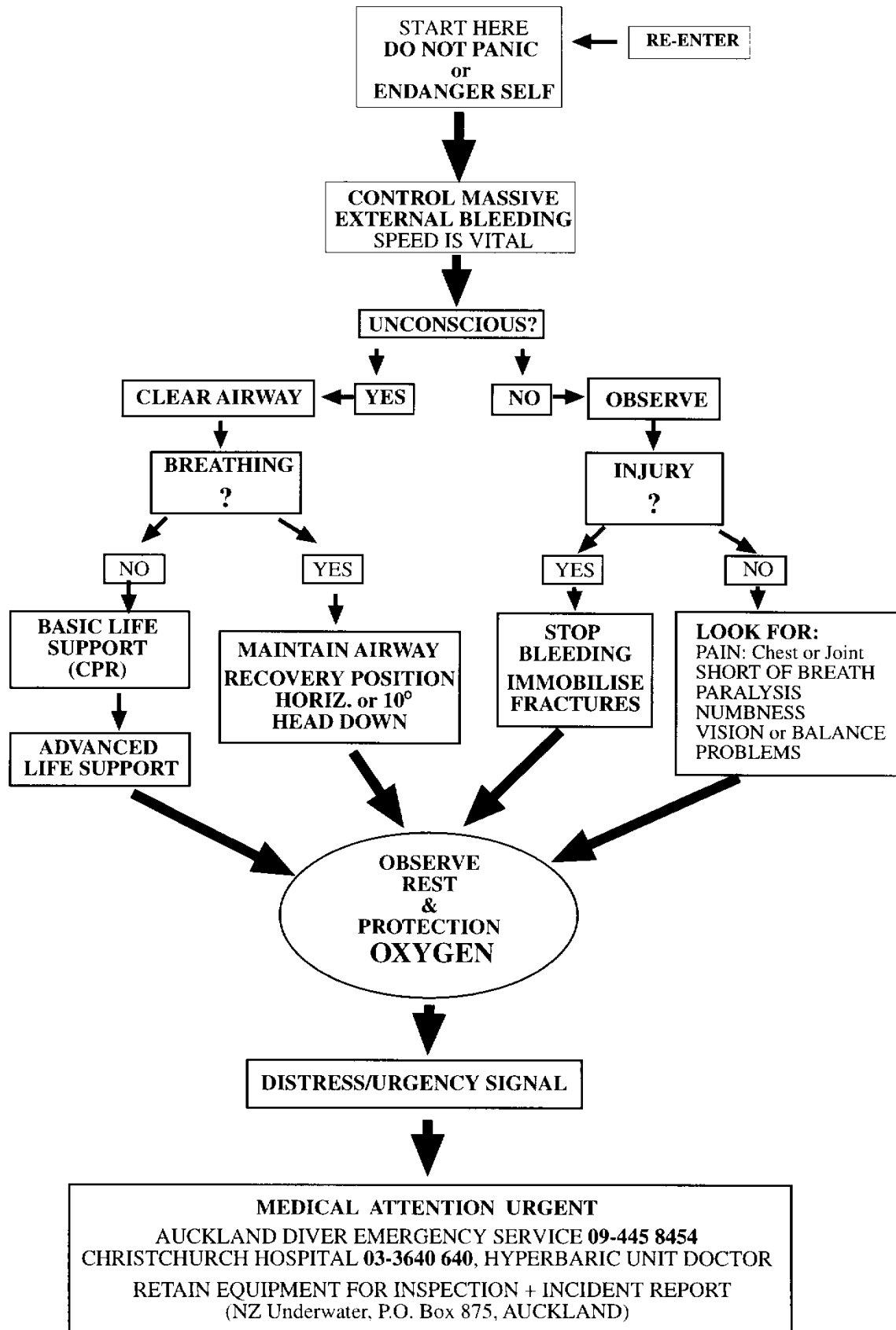


Figure 1. First Aid Algorithm: This decision flow chart is the 1997 revision of a chart originally developed by the author in 1978 for teaching diving first aid management. This was first published in the SPUMS Journal (Supplement) 1981: 63-67 and subsequently promulgated in Australia in a revised form by SPUMS (See pages 36 to 39). A very similar flow chart appears on the back cover of the DES Emergency Handbook, revised 4th Edition, John Lippmann & Stan Bugg.

TABLE 2**TEN COMMANDMENTS OF FIRST AID FOR DIVERS**

1	Do NOT place yourself in DANGER and KEEP CALM.
2	BASIC LIFE SUPPORT - Airway, Breathing, Circulation.
3	POSTURE - recovery position, control bleeding, immobilisation.
4	OXYGEN - in every case.
5	REST and PROTECT - from the elements, further injury, spread of toxins etc.
6	OBSERVE and RECORD - the diver's condition repeatedly and without bias.
7	CONSULT - Emergency Services, medical advice (e.g. DES/DAN).
8	SPECIFIC CARE - Fluids, marine stings and bites, Advanced Life Support.
9	EVACUATE - Hospital/Hyperbaric Centre etc.
10	SECURE EQUIPMENT and DOCUMENT the accident fully.

What replaces disease-orientated diagnosis in the immediate First Aid management of diving accidents is condition recognition. That is, the establishment of priorities in immediate care. For instance, there is little point treating shock only with intravenous fluids if the real cause of the shock is severe hypoxia from upper airway obstruction due to head trauma from an outboard propeller blade and not the haemorrhage from the scalp wound!

Therefore, the question is largely rhetorical. Of course diagnosis is important, but primarily to identify and decide priorities for immediate life-threatening problems such as airway obstruction, rather than to determine a disease label.

Principals 1-6 in Table 2 do not require disease recognition and it is only for 8, often combined with 7, that this becomes necessary.

Figure 1 is a flowchart (algorithm) used by the author for many years for teaching diving accident management.

Dr Michael Davis, MD, FANZCA, Dip DHM, is Director, Hyperbaric Medicine Unit, Christchurch Hospital, Private Bag 4710, Christchurch, New Zealand. Fax +64-3-364-0187. E-mail hbu@chhlth.govt.nz .

DIVER LOCATION DEVICES

David Davies

Abstract

Much has been written about the first aid and medical management of the injured diver, but the initial step in this management is to remove the diver from the source of injury, and this requires that first the diver must be found. There is little on this subject in the diving literature so most of the information needs to be gleaned from other sources.

All too frequently divers become separated on the surface from either their companions or the dive boat. Many survivors later report that, although they could see the boat, they were unable to attract its attention. Numerous devices have been used in the past to rectify this situation including a torch, camera strobe, flares, coloured dye, the Safety Sausage, a whistle and a sonic beacon. All have proved of limited value.

This paper classifies and compares some of these devices and makes suggestions for two cheap alternatives which should become part of a diver's routine equipment and enable rescuers to locate a lost diver more rapidly.

Key Words

Equipment, safety.

Introduction

A short time before the last SPUMS meeting in Palau (1993), a group of Japanese divers and their dive guide was swept off Peleliu Corner by unexpected currents.¹ Despite intensive air and sea searches, the divers were not found for five days, by which time they had succumbed to exposure. A diary of the event, kept by one of the divers until she died, recorded that rescue craft had passed within two