



# Freediving Safety Guidelines

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STAY SAFE OUTDOORS BY ROB GARDNER

IN THIS ISSUE V1

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## THE SAFETY PROCEDURES

### 1) Never Free Dive alone and select your partner

#### Fixed Weights

- Depth – Never dive at the same time as your partner
- Line – The safety diver watches the dive line for the Freediver who must follow it at all times.
- Partner – should be easily capable of rescuing a diver from the required depth (at least 15m) and **should be fully trained in rescue techniques, CPR and administration of O2 etc.**
- Meeting – The objective is for the safety diver to meet the freediver and escort him- Face to Face through the area of greatest danger – which is between 15m and the surface. The depth at which they meet should be relative to the depth that the freediver has dived **but not deeper than 15m**. In all dives the safety diver is responsible for timing the dive and he should begin his descent at half the expected dive time.
- Any dives greater than **30m require either a stand-by SCUBA set with organised lift tackle** or a safety lanyard and retrieval system. Different sea/lake conditions may require safety divers at more frequent intervals.

## 2) Never Free Dive after a Scuba Dive

- The Nitrogen remaining in the tissues after Scuba Diving can lead to decompression sickness when micro-bubbles are recompressed and their consequent expansion upon the rapid ascent during an ensuing freedive. Those with PFO are in a much higher risk category.
- Wait at least 12 hours after a Scuba Dive before you do a Free Dive.

## 3) Never 'ride' the flexibility of your eardrum.

- Equalise on descent only (about every 3m). Never force an equalisation. Never continue after a failed equalisation – abort the dive! Never equalise on ascent.
- A nose clip, where used should be removed at the beginning of the ascent.
- *"'Ramboism' The 'I must get to 40m' syndrome. I successfully dive to 35m and equalise, cannot equalise at 38m but try for 40m nevertheless as the bottom seems close and pressure differentials are less. This is a seductive process and is nothing but a gamble on the flexibility of an eardrum. If you guess wrong the result can be a burst eardrum with its associated consequences; extreme vertigo and nausea "*

## 4) Always be correctly weighted

- It is dangerous to be over weighted. This can cause equalisation problems on descent and on ascent can cause an unnecessary expenditure of effort. Particularly dangerous with thicker suits for winter diving. A good rule of thumb is to achieve neutral buoyancy at 15m.

## 5) Before diving make a complete dive plan together and estimate sea conditions

- It is essential that every diver working on a given dive line, knows exactly what every other diver will be doing during the course of the outing. This includes warm-ups, deep dives etc.
- Who is doing safety for whom and when.
- What to do in the event of an emergency.
- How sea conditions will affect the dive and safety i.e. current, visibility, water temperature, swell, distance from the shore and surface traffic.
- Current is one of the most important factors to be considered. In Fixed Weights it involves much more effort on the part of the diver to stay close to the dive line.
- Poor visibility as in lake diving indicates a need for more safety procedures.
- Water temperature effects the choice of suit and hence weights.
- Surface Conditions cannot be entirely ignored and can affect the behaviour of surface traffic/ low angle sun and a choppy sea can make a Free Diver on the surface nearly invisible and care must be taken

## 6) Remove the snorkel from your mouth

- On returning to the surface blast clearing of the snorkel nearly invariably leads to SWB if a diver has been close to his maximum. Retention of the snorkel at depth complicates equalisation and when diaphragm contractions begin can lead to the inhalation of water.

## 7) Never exhale under water or forcefully exhale on surfacing

- Exhalation on descent can cause early problems with equalisation. On ascent it causes loss of buoyancy and hence more effort on the ascent which can lead to SWB. With any dramatic fall in the pressure in the lungs the remaining reserve of oxygen in the blood will go to the lung and not the brain hence causing SWB. Any diaphragmatic movement will also act as an instigator of the breathing mechanism.

## 8) Never dive without adequate rigging and flags

- The 'safety' dive line indicates a corridor along which a safety diver can anticipate the return of a diver from depth.
- Where a buoy and not the boat is used to suspend the line, is used it should be orange or red to be easily visible to surface traffic. It should be sufficiently large so that it cannot be pulled under the surface, even by two divers ascending together. Its purpose is to support the dive (safety) line and give the diver on the surface a restful place to prepare his/her dive.
- The safety line should be at least 10mms thick to allow for a good grip, preferably white in colour. Its purpose is to indicate the vertical ascent and descent.
- The line serves as safety. A diver who loses a fin or has a leg cramp can pull himself to the surface.
- 5kgs is usually adequate for Fixed Weights whereas for Free Immersion, depending on the thickness of suits used a weight of up to 30kgs may be necessary.
- The cover boat should fly the "diver down" flag.

## 9) Preserve the correct interval between deep dives. Be Aware of the danger of multiple deep dives

- Not less than 5mins between deep dives and up to 8mins depending on water temperature. The purpose of this is to allow gas balances to return to normal. O<sub>2</sub> and CO<sub>2</sub> / Lactic Acid.
- If you are performing to 85% or more of your maximum or trying for a personal best multiple deep dives can severely stress the system and the build up of lactic acid could be dangerous on subsequent dives. Never do more than 1 or 2 deep dives in a session.

## 10) Never hyperventilate

- Hyperventilation is more than 15 deep breaths per minute. This predisposes a diver to begin the descent in tension with a high pulse rate and decreased CO<sub>2</sub>. An improper balance of O<sub>2</sub> and CO<sub>2</sub> can prolong the "easy phase" of breath-hold at the expense of the "struggle phase" and could lead to SWB. Proper ventilation has the following objectives; maximum O<sub>2</sub> saturation and minimum pulse rate. This is achieved by **slow**, deep strong ventilation, relaxation and concentration, and this not overdone.

## 11) Avoid too rapid a turn around

- Too dramatic a turn around at the end of the descent can lead to "deep water blackout". This is particularly true of very deep dives where blood shift is already a factor.

## 12) Never look down on descent or up on ascent

- Neck extension will cause difficulty in equalisation on descent and on ascent will affect necessary blood flow to the brain and increase pressure in the area of the baro-receptors in the neck sending the wrong message to the central nervous system which may increase pulse rate.
- Also it is also contrary to a hydrodynamic position.

## 13) Don't increase pace on the last part of the ascent

- Economy of movement is essential to conserve O<sub>2</sub> and keep the pulse rate low. At the turn around point patience, calm and economy of effort are essential. During the ascent a measured pace must be preserved throughout in spite of lactic acid build up.

## 14) The **Dangers** of 'Empty Lung' Dives

- '**Empty Lung**' dives are purely an advanced technique which should be approached with **EXTREME** caution and under the direct supervision of an experienced instructor of these techniques. **Severe and possibly permanent damage or death can result if misunderstood.**
- The diver begins the descent with low O<sub>2</sub> and can blackout without warning at depth where he will be negatively buoyant. If he does not get a laryngospasm at this point the negative pressure in his lungs will siphon in water and a certain drowning will ensue.
- A partner on full lungs should accompany the diver for the whole of the dive.
- Empty Lungs should never be done with a weight-belt on.

### 15) No diving after a samba or black out

- Any category of 'Loss of Motor Control' at the end of a dive should indicate the end of diving for that person for that day. Cyanosis, i.e. blue lips, at the end of a dive should indicate that a diver is at his limit for that day. He should be encouraged only to dive at shallower depths.

### 16) Allow sufficient time for physiological adaptation.

- The body needs **TIME** to adapt to new and extreme conditions of prolonged breath-hold and great pressure. Temperature can vastly aggravate or exacerbate the above problems and should not be underestimated. The body is very flexible and forgiving BUT it is still essential to allow it sufficient time to adapt to new stresses.
- A headlong rush for greater depth or breath-hold times can either end in severe physical trauma or create a mental 'wall'.
- Problems like tinitis, pulmonary oedema, or other pulmonary barotrauma, sinus or even certain types of cardiac problems can result from 'pushing' too hard and too fast.

### 17) Avoid negative suggestion

- This can lead to stress and hence a danger of SWB. The psychology of Freediving works on understanding the tremendous power of mental suggestion, and how thinking positively and correct command phraseology can greatly assist in dive performance.

### 18) Never dive when tired or cold

- Cold, tiredness, alcohol and drugs all impair judgement and breath-hold ability and predispose a diver to SWB. One of the first symptoms of hypothermia is tiredness and impaired judgement plus lactic acid build up can be deadly. As soon as you feel you are cold your breath-hold ability has already been compromised. Do **NOT** underestimate cold.
- Congestion obviously leads to equalisation difficulties and the greater danger of 'reversed ear'.

### 19) Food and Hydration

- It is recommended NOT to freedive within 4 hrs of a full meal or two hours after a light snack. A large volume of blood that could be carrying O<sub>2</sub> to the brain is being diverted to the digestive system. Freediving nutrition is a whole issue in itself and should be understood.
- Dehydration, which in a freediver is caused by several factors; the mammalian dive reflex (greater production of urine), the expelling of huge quantities of water during ventilation and the chemical exchanges needed for energy production.

- Water should be there at every dive session and divers should be encouraged to drink. Dehydration **vastly increases the risk of SWB and severely compounds equalisation problems.**

## 20) "KNOW YOURSELF"

- **A FREEDIVER is NOT a super athlete every day or on every dive.** It is important to understand where the axiom, "make your worst day your best day" is genuinely not applicable.
- A freediver should learn to be in touch with himself/herself at all times and to know when to push and when to back off, to know when he is finding excuses and being mentally lazy, and when there is a genuine limitation FOR THAT DAY. This could be an ear problem from a previous trauma, the beginnings of a fever or flu, and for a woman, knowing that at the time of ovulation or a period she might experience difficulties equalising or with the sinuses or feel particularly tired.

# Freediving Safety Guidelines

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## Safety notes

- **Get checked out by a doctor first, have a certificate of good health**
- **Have all people fill out and sign a fitness form, your aware of allergies and medical problems, or have any special requirements.**
- **Maintain a log of dives and depths**
- **First aid kit with O<sub>2</sub> be available on the boat.**
- **Everyone should have min 16hr first aid cert**
- **An oxygen meter be included in first aid box, to measure O<sub>2</sub> in blood**
- **Have Emergency action plan, written out and ensure all aboard know what to do.**
- **Do a risk assessment**
- **Give a dive briefing before setting off from shore**
- **Practise rescues and keep a log of training.**
- **New divers must not go beyond 15mts**

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