

SPUMS ANNUAL SCIENTIFIC MEETING 1997

The 1997 Annual Scientific Meeting is to be held at the Waitangi Resort, Paihia in Northland, New Zealand from April 13th to 20th.

The theme of the meeting will be "The Pathophysiology and Treatment of Decompression Illness" and the Workshop will be devoted to the "First Aid Management of Diving Accidents".

Confirmed speakers are Dr James Francis, until recently at the Naval Medical Institute, Alverstoke, England and Dr Richard Moon of Duke University Medical Centre, Durham, North Carolina, U.S.A. Both are excellent speakers and acknowledged experts in the field of decompression illness.

The venue is a first class resort hotel immediately adjacent to the historic Waitangi Treaty House and situated right on the foreshore of the beautiful Bay of Islands. There is outstanding temperate water diving in the region, especially at the Poor Knights Islands with water temperatures at that time of the year around 20-22°C. The region is renowned for its sailing and game fishing and there is a huge range of land based activities for registrants and their families.

Conference conveners are Dr Michael Davis, Medical Director, Hyperbaric Medical Unit, Christchurch Hospital, Private Bag 4710, Christchurch, New Zealand and Associate Professor Des Gorman, Department of Occupational Health, University of Auckland School of Medicine. Enquiries should be addressed to Mike Davis in Christchurch.

LETTERS TO THE EDITOR

WHAT IS TECHNICAL DIVING ?

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5/1/96

Dear Editor

With no intention to either condemn or praise the practice, I would like to take issue with the definition of "technical recreational diving" in Des Gorman's review of the Safe Limits Symposium which was in the June issue (1995; 25 (2): 110-113).

Des' list of technical diving practices included diving deeper than 50 msw and diving with oxygen-nitrogen mixtures. Now, some hot-dog divers have been diving air deeper than 40 or 50 msw since not long after air was invented, with nothing more technical than any other dive. Likewise, diving with oxygen-enriched air involves nothing any different from an ordinary dive except a little more knowledge, certainly nothing "technical" about the dive part (making and analysing the mixes yourself, okay, that is technical).

Technical diving is diving beyond the normal range using special equipment, techniques and competence. One good minimal definition of a technical dive is a dive involving a change of gases. (That has to be extended to include diving with a rebreather.)

Come to the meeting in the Maldives to hash this one over.

Bill Hamilton

Key Words

Letter, technical diving, nitrox.

Editor's note

Dr R W Hamilton, PhD, is one of the guest speakers at the 1996 Annual Scientific Meeting in the Maldives from April 20th to 28th 1996.

UNDERWATER OXYGEN TREATMENT FOR DECOMPRESSION SICKNESS

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31/1/1996

Dear Editor

I have read with interest the editorial in the September 1995 edition of the SPUMS Journal and the review of underwater oxygen treatment of decompression sickness by Dr Carl Edmonds.^{1,2}

In this I see considerable discussion on the underwater use of oxygen for the prevention of decompression sickness (DCS). Dr Carl Edmonds' review deals with the Australian oxygen underwater tables and the use of oxygen for DCS treatment in the areas of tropical island divers and North West Australian pearl divers. Both of these cases are remote from the majority of treatment areas.

I feel that a more in depth discussion should be undertaken on the use of underwater oxygen treatment for recreational divers undertaking a higher level of risk in their diving. These deep and/or technical divers (be it either deep wreck, reef or cave divers) who, through more advanced diver training, are pushing the traditional limits of recreational diving face an increased DCS risk and the understanding of and ability to respond to any hyperbaric trauma should be a primary point of discussion.

As a diver personally involved in undertaking this type of "technical" diving as well as a part-time instructor in this level of advanced training I would ask both Dr Carl Edmonds and the SPUMS medical membership to examine closely the practice of immediate underwater oxygen recompression in cases of the risk of hyperbaric exposure. From a personal perspective I believe that those individuals undertaking this type of diving, as well as those supplying the boat charter services, should be given guidelines on immediate in-water oxygen treatment. Oxygen underwater recompression has been used successfully both in Australia (Case 1) and overseas whereas the denial of this treatment (Case 2) may have resulted in a fatality.

Case 1

The successful use of underwater oxygen recompression occurred with a female Australian sports diver undertaking a deep wreck dive in mid 1992.

The diver having descended to a depth of 66 m noticed her buoyancy increasing and returned to the anchor line to deal with the situation. She became more buoyant, needing to hold on to the anchor line, and signalled her buddy. It was discovered that the low pressure inflator had over-inflated her buoyancy control device (BCD) and when disconnected it was free flowing. The regulator in question was shut down (she was using twin tanks with separate first stage regulators, each with a second stage and a low pressure feed, one set connected to the BCD and the other to "wings", a redundant BCD), she swapped to the second tank regulator and both divers began their ascent. They met a second pair of divers during the ascent, signalled they required assistance and all the divers began to ascend.

During this ascent, she signalled one of the fresh divers accompanying her that she was low on air and needed to share air. Then, with one hand holding her loan

regulator and one the accompanying diver, she was unable to vent her BCD properly. The pair lost contact with the anchor line and began an immediate uncontrolled ascent to the surface. She reached the surface having had an 18 minute dive time to a depth of 66 m without any decompression but with no obvious signs of DCS. The boat operator immediately placed her on the decompression lines and she was taken to six m using pure oxygen. She was given, using open circuit scuba, oxygen for 30 minutes at six m, then at three m for 30 minutes.

At all stages she was accompanied by one or more divers monitoring her continuously to ensure that if there was any sign of oxygen toxicity she would immediately be returned to the surface. Upon surfacing, she was placed flat in the boat and given oxygen for another 30 minutes. On landing she was immediately transported to the recompression chamber.

Within one hour of being admitted to the hospital, the diver showed signs of lethargy and loss of co-ordination. She was recompressed over three treatments at the chamber and subsequent examination showed no deficit remaining. She resumed diving six weeks later.

Case 2

The second case involves a father and son diving off the east coast of the United States on a submarine known as the "U-Who".

They descended to a depth of 70 m, removed their decompression tanks and entered the submarine for their planned dive, in one end and out the other. During the penetration, the divers became disorientated due to a collapse of part of the internal structure and following a careful dive through low visibility, exited the submarine. They were now beyond their planned 20 minute bottom time and began their return journey along the submarine to collect their decompression tanks. Having extended their bottom time 11 minutes longer than planned without reaching their decompression tanks and being very low on air, they began a direct ascent to the surface.

Upon surfacing the father had limited use of his arms and legs and while being assisted onto the boat, went into respiratory failure and 20 minutes later cardiac arrest. The son was conscious on the surface but without feelings in his arms or legs. He was transported to a recompression chamber and responded to initial treatment (USN Table 6a) but during his first air break his heart stopped and resuscitation was unsuccessful.

It has been discussed in technical diving journals that immediate in-water oxygen recompression may have averted the second fatality.

Discussion

I am a deep wreck and cave diver and part-time "technical" instructor. **These are my private comments. They do not represent, in any way, the views of any technical diving training agency nor those of the technical diving community in Australia.**

It maybe unwise to directly compare the Australian case with the American incident, however, it is obvious the use of immediate underwater oxygen recompression for treatment delayed, if not offset, any hyperbaric trauma to the diver in the Australian case.

I am interested in both Dr Carl Edmonds' response to the use of such treatment as well as the position and views of the SPUMS Committee and medical membership as to how the ever increasing band of technical divers will be advised on how such treatment can be best undertaken with minimal risk but maximum benefit to the DCS patient.

Richard Taylor

References

- 1 Editorial. *SPUMS J* 1995; 25 (3):121
- 2 Edmonds C. Underwater oxygen treatment of decompression sickness. *SPUMS J* 1995; 25 (3):122-128

Key Words

Letter, decompression illness, treatment, oxygen.

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5th March, 1996

Dear Editor

In reply to Mr Taylor's query I would like to thank him for his letter. My reply is below.

I do not believe there is any real doubt, nowadays, about the immense value of a very early response to developing decompression sickness.

There seems also little doubt regarding the value of the underwater oxygen option. Nevertheless, the pearl divers do it one way, the abalone divers do it another, the US Navy do it quite differently and they are all somewhat at variance with my original recommendations. That is fair, because we are all probably treating somewhat different divers i.e. divers who have behaved quite differently in order to get their DCS.

The Australian pearl divers have a very stereotyped and set regime, which probably works very well as their dives are also very stereotyped. Thus they can probably get away with just one protocol.

The abalone divers, doing all sorts of different things, tend to use all sorts of underwater oxygen treatments.

The US Navy, dealing with their own divers who have always either done the "correct decompression" dive or one that would only impinge very slightly into decompression profiles, get away with their regime.

I originally introduced the underwater oxygen for divers in remote areas, where nothing else is available, and there was often a considerable delay in even getting the oxygen. Thus I had to be a little bit more flexible in my regime than, say, the pearl divers.

You have now introduced another type of diver, the technical diver. I have great philosophical difficulties with this. I have no problem with people doing whatever they want to themselves, as long as they do not entice or involve others. My reservations are that compressed air diving is hazardous enough, especially to those who are not very experienced, and I worry when inadequately trained kids are encouraged to do deep and extended diving, often with apparatus that has limits beyond their understanding. Thus I am not in favour of "technical diving", except for the extremely capable, experienced and very well trained diver.

When the latter is affected with a diving illness, it is my belief that it is likely to be far more significant and potentially more hazardous than most compressed air diving situations. Many would argue with this, and claim that because the physiological principles are the same, so should the illnesses be.

It is my view that if technical diving was used to genuinely reduce hazards, by reducing the duration of the dives, then I would be far more in favour of it. The opposite is usually the real intention for its use.

Having said all this, it does not mean that I would not use the oxygen underwater treatment. I probably would in the individual case. I would just be worried that its application to the technical diving group could lead to multiple problems including oxygen toxicity or serious decompression illness, which are less in the conventional and recreational compressed air diver. I see this as a potential for attributing disrepute to a valuable first aid option.

I would also be a little concerned that many of the technical divers might believe that their knowledge and experience is such that they do not need to follow up the underwater oxygen treatment with either further treatment or diving medical assessment.