

tempted by the rewards of salvage, dive on deeper wrecks in the hope of turning their sport into a lucrative pastime.

Sport diving casualties account for the vast majority of diving injuries treated throughout the world. Recent trends in the numbers and types of diving casualties have created increased concern among members of the medical community and of this Committee. New scientific evidence heightens our concern that permanent central nervous system damage occurs following some incidents of neurological decompression sickness. Also of concern are the potential effects on other systems, notably the skeletal system, in the form of dysbaric osteonecrosis. These kinds of damage, while subclinical in most cases, may lead to serious long term disability and are, for the most part, avoidable with a reasonable degree of caution.

Whilst the majority of sport divers are considered to be well trained and responsible, there appears to be a prevalent philosophy among some that they can dive deeper, longer and more often without penalty. The following points are stressed:

1. The depth limit for North Sea commercial diving on compressed air is 50 metres. This depth is based on safety considerations and a recognition of the increasing risks to divers at greater depths. In a commercial situation, dives conducted at depths in excess of 30 metres are carefully controlled and normally require a recompression chamber on site as well as full supervisory backup. It is stressed that sport divers should never exceed 50 metres and that, in isolated areas or in the absence of proper supervisory personnel, a shallower depth is recommended. Thirty metres is considered a reasonable depth limit for most sport diving activity.
2. The single most identifiable cause of decompression sickness and other diving related problems is the time depth profile of a dive. Multi-day repetitive diving increases the risk of an incident. While a decompression incident can occur following a dive within the established limits of any table, dives involving decompression stops in the water are at an increased risk compared to dives conducted within established no stop times. Careful planning and execution of a dive remains the best way to avoid a diving related problem.
3. Dive only on well tested and accepted tables and stay well within the guidelines of these tables. Great care must be exercised in the use of decompression computers. Where used, they should be as a backup to a properly planned dive on accepted tables. Consideration must be given to known risk factors such as age, fatigue and degree of fitness. Never push a dive to the limits of your table and avoid incurring a decompression stop requirement if possible. No stop

diving is recommended for most sport diving activity.

4. Diving is an exciting but potentially dangerous sport. Each year a number of divers die in diving related accidents. Others are left with a permanent disability. Decompression sickness is not an innocuous disease. Although the majority of divers appear to recover normal function following treatment, the end result in some cases is likely to be underlying central nervous system damage of a permanent nature.
5. Carefully planned and executed, diving can be a safe and enjoyable sport. Experience alone will not protect you and may lead to a false sense of security. The potential risks of diving must never be forgotten.

The Diving Medical Advisory Committee

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Sir

We have followed with interest your reprint¹ of the Robert Monaghan *Undercurrent* article and the one published in the *SPUMS Journal*² regarding diver population and accident rates.

As those articles have shown, PADI and others have repeatedly refuted his claims and his misuse and misrepresentation of certain data. This final chapter deserves comment as well.

To put his "analysis" in perspective, the following are but a few of the misrepresentations Monaghan has made in his reports:

1. Monaghan claimed a PADI survey indicated an 80% annual diver drop-out rate. Actually, PADI's survey reported the opposite, that the drop-out rate could **not** be 80% (Monaghan was informed of this misrepresentation but has continued to make it).
2. Monaghan claimed that published Australian diver fatality rates should be proof that published US rates are too low. What he did not share with readers was that the Australian rates he quoted were not total fatalities compared to total diver population (as the US rates are computed), but instead the total fatalities compared to the number of divers certified in a year by PADI Australia. Such a ratio would obviously be higher than the figures reported in the US.

3. Monaghan claims that “PADI Australia reports 20 diving deaths per 100,000 active Japanese divers”. The term active is **not** used by PADI Australia’s report and PADI Australia actually reported there were 19.4 fatalities per 100,000 Japanese divers in 1986 (according to the *Jinko Dotai Tokei* by the Japanese Ministry of Welfare). Incidentally, this figure fell to 0.6 fatalities per 100,000 in 1987. Monaghan then used this to again “prove” that the US rates must be too low. What Mr Monaghan withheld from his article, however, is that *Diving Accident Management in Australia* also showed that, despite the high overall rate, **PADI** divers in Japan had a fatality rate of only 3 per 100,000 (a figure remarkably similar to the rates independently reported for the US by NUADC).

4. Monaghan claims that Diagnostic Research Inc. (DRI) (the company that conducted a recent diver drop-out and diver population study for DEMA) reported “only 3 million” divers in the US and goes on to say that his model (with certain additions) produces similar results. In reality, the DRI study reported that there were between 5.27 and 7.07 million people in the US who had become certified divers at one time or another. Further, they reported that “2.65 million adults are current or active scuba divers”. The DRI report went on to detail a statistical accuracy of +0.3, concluding “The estimated number of active divers ranges from a low of 2.09 million to a high of 3.22 million”.

The DRI study, rather than supporting Monaghan’s model as he implies, disputes it.

5. Further, Monaghan claims that “PADI’s own US diver estimates are substantially less than the NUADC figures”. Actually, PADI’s estimate was 2.5 million **certified** divers (this number does not include, however, all uncertified divers, military trained divers, commercial divers, etc., a sizable group by any estimation). NUADC’s estimate of diver population was 2.6 to 2.9 million. Since the Diagnostic Research Inc. study was released, however, NUADC has adopted the DRI figures and current fatality rates are based on DRI’s population estimates.

Monaghan goes on to make several other statements that have no basis in fact. He implies that PADI claims there is a low death rate. PADI makes no such claims. PADI does, however, publish the data provided by bonafide organisations, such as the NUADC.

He also impugns the NUADC by implying that it is not “independent”. This is spurious and uncalled for. The NUADC has been in operation since the late 1960s and its operating procedures meet the guidelines and audits of both the University of Rhode Island and the US Federal Government’s National Oceanographic and Atmospheric Administration (NOAA).

Finally, Monaghan implies that those who report the NUADC findings “prefer to remain complacent about diving

safety based on the low claimed death rates”. The NUADC analyses have shown a clear trend of improving diver safety over the last 12 years. This has occurred because the diving community in the US has put forth significant effort and the results are showing. The fact that safety statistics show improvement needs to be known by the diving community, this knowledge serves as a powerful reinforcement that efforts toward diver safety are working.

Perhaps the most unfortunate aspect of this matter is that it is not the result of poor statistical science. It is not well-known that Mr Monaghan was employed by the law firm that filed the *Dibble vs. PADI* lawsuit. The lawsuit attempted to claim that PADI’s methods were harming diver safety, NUADC’s statistics contradicted those allegations and an attack on NUADC’s statistics and its principle researcher, Mr John MacAniff, was begun. Monaghan’s recent articles are only a part of that effort.

There is no question that the trend in the US is increased diver safety. In 1976, there were 147 recreational diver fatalities in the US and in 1987 there were 87. Even if one does not consider rates (which requires the defining of the total participant population), safety has clearly improved. However, we doubt seriously that anyone would claim that the number of divers has not increased since 1976! The conclusion that diving is becoming safer is shared by Divers Alert Network (DAN). DAN’s Fall 1988 issue of the publication “Alert Diver”, stated “while diving is not without risk, it has a much better safety record than many have previously believed, no matter what numbers you use or how you look at it”.

When the statistics are presented correctly, it is clear that one important, undeniable trend is taking place. In the US, in Japan, and in Australia, as PADI’s market share has increased, (currently exceeding 60% of divers trained), there has been a corresponding decrease in diver fatality rates. PADI does not feel this is, nor could be, mere coincidence.

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References

- 1 Monaghan R. The risks of sport diving: just how many divers are there ? *SPUMS J* 1988; 18 (2): 53-60.
- 2 Monaghan R. Australian diving death rates: comparisons with USA and Japan. *SPUMS J* 1989; 19 (1):24-25.

Abbreviations used in this letter.

PADI = Professional Association of Diving Instructors
DEMA = Diving Equipment Manufacturers Association
NUADC = National Underwater Accident Data Center

This letter has been shortened for publication. Interested readers can obtain the original text from PADI Australia.

This correspondence is now closed. Editor.