clear, limited diving may be permitted to a maximum depth of 18 metres without any free ascent practice.

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Dr Carl Edmonds' address is Diving Medical Centre,66 Pacific Highway, St Leonards, New South Wales 2065, Australia.

A NEW CLASSIFICATION FOR THE DECOMPRESSION ILLNESSES.
Report on a workshop held at the Institute of Naval Medicine, Alverstoke, United Kingdom, October 1990

Des Gorman

Recently the Royal Navy Institute of Naval Medicine (INM) sponsored a 2 day workshop at the Institute to develop a new classification for the decompression illnesses. This was prompted by an attempt at organising a multi-centre trial of lignocaine in cerebral arterial gas embolism (CAGE), which foundered when diagnostic criteria for CAGE could not be agreed. Funding for the workshop was provided by INM and 35 delegates were invited and attended; including the author, Carl Edmonds, David Elliott, James Francis, Tom Shields, Ed Thalmann, Ed Flynn, Drew Dutka, Ramsay Pearson, Lindsay Symon, David Dennison, Richard Moon, Maurice Cross, Ian Calder, Hans Ornahagen and Yehuda Melamed. The proceedings will be published by the Undersea and Hyperbaric Medicine Society.

The existing classification.

Before the Workshop the decompression illnesses were conventionally divided into CAGE and decompression sickness (DCS). DCS was further divided in types I (mild) and II (serious) in a system proposed over 30 years ago for caisson work.[1] The workshop participants agreed that although sudden loss of consciousness in a scuba diving candidate on surfacing in a swimming pool was almost certainly CAGE and that left knee pain in a saturation diver developing 6 hours after reaching the surface was similarly certain to be DCS, between these two extremes differentiation was often impossible.

Furthermore it was agreed that:

a CAGE can present before reaching the surface;

b almost all cases of cerebral DCS have symptoms within 20 minutes of surfacing;

c many cases of cerebral DCS were likely to be due to arterialisation of venous bubbles and hence that DCS often initiated CAGE;

d arterial emboli could either precipitate DCS or occur concurrently with DCS (the so-called type III DCS [2]);

e most cases of CAGE did not have any evidence of lung damage;

f in submarine escapees de-novo formation of bubbles in arteries could not be completely excluded; and,

g while most cases of CAGE showed some spontaneous recovery many were static or progressive.

Many delegates reported that attempts at retrospective analysis of case histories had resulted in very low concordance between observers in the diagnosis of either

CAGE or DCS. Also, the recent decision of the United States Navy to treat CAGE initially at 2.8 bar breathing 100% oxygen meant that most of those attending had no incentive to make the distinction as treatment regimens were essentially common. This is particularly true given the move away from a significant head-down posture for CAGE sufferers.

Similarly, the type I and type II DCS classification was considered unsatisfactory because:

a if left untreated at least 30% of type I DCS cases developed overt evidence of neurological involvement;

b the frequency of long-term personality, psychological and neurological sequelae was almost as high in divers with a history of type I DCS as in those with type II DCS;

c type II DCS could indicate anything between a diver with paraesthesia in the left finger and either an unconscious diver or a diver with intractable hypotension and shock;

d in diving operations, technicians and divers (and most doctors) are unable to identify subtle neurological signs and hence make a diagnosis of type II DCS; and,

e much of the pain in DCS was likely to be referred from the nervous system.

It was accepted unanimously then that the existing classification needed to be changed and that for the reasons given above neither an aetiological nor an organ-system classification was achievable. The latter would be made even more difficult by the multi-focal nature of the decompression illnesses.

The consensus then was that:

a no attempt should be made to distinguish CAGE from DCS; and,

b a clinical descriptive classification should be developed.

A clinical descriptive classification of the decompression disorders

The term decompression illness was proposed and accepted to include both the previous DCS and CAGE categories and to demonstrate that no distinction was being made.

It was agreed that this term should be prefaced firstly by an evolutionary term (static, resolving, relapsing, progressive etc) and secondly by an organ system term (these being the symptomatic organ systems). For example: a diver who collapsed on surfacing, was found to be unconscious and then recovered would have "resolving neurological decompression illness"; a diver who had increasing shoulder pain would have "progressive musculoskeletal decompression illness"; and, a diver with unchanging shortness of breath and paraplegia would have "static pulmonary and neurological decompression illness". The last case illustrates that no attempt is made at putting symptoms into a hierarchy.

The overall classification of decompression disorders would then be:

a **Barotrauma**
- ENT
- Pulmonary (radiologically or clinically apparent pneumothorax, mediastinal and sub-cutaneous emphysema)
- Others

b **Decompression illness**

The lignocaine trial.

It now becomes possible to perform the planned CAGE-Lignocaine trial by identifying the applicable clinical syndromes (e.g. only progressive neurological decompression illness cases).

Other conclusions

In addition to agreeing to a trial of this new classification, the participants conceded the need for a common database for diving accidents. The composition of this database will form the basis of a subsequent workshop.

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Dr Des Gorman, FACOM, PhD, is Director of the Hyperbaric Medicine Unit, Royal New Zealand Navy and also holds appointments at the Royal Adelaide Hospital and The University of Adelaide.

His address is the Hyperbaric Medicine Unit , Royal New Zealand Naval Hospital, HMNZS PHILOMEL, Devonport, Auckland 9, NEW ZEALAND.