

The Diving Medical Advisory Committee

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Fitness to Return to Diving after Decompression Illness

DMAC I3 Rev. 2 – November 2017

Supersedes DMAC I3 Rev. 1, which is now withdrawn

1 Introduction

Decompression disorders are known to be complex, involving more systems of the body than is apparent from the clinical presentation. They may result in chronic injury to some tissues, particularly the nervous system and, possibly, the lungs and bones. As a result, there has been a continued emphasis on the early treatment of even minor symptoms, and of potential cases where the diagnosis is not certain. There is a tendency to lengthen lay-off periods after treatment as we become increasingly more aware of the complexity of the illness.

It is possible that divers may fail to report decompression illness (DCI) because of unfamiliarity with the condition or because of concern over the implications for their immediate or long term employment. In determining guidance on fitness to return to diving, the implications of such advice on the reporting of symptoms must be considered. However, a higher priority is to provide, in the light of current knowledge, advice which will serve to minimise the extent of any injury and possible repeat injury to the diver.

2 Medical Decision Process

The medical decision concerning the fitness to return to diving for a diver who has sustained an episode of decompression illness is complex because of the lack of concrete medical evidence to determine the risk following the various circumstances which may occur.

There are three issues involved in the decision process:

- ◆ Should the diver should return to diving at all?
- ◆ If it is considered appropriate to return to diving, how soon should the diver return to diving?
- ◆ Should there be any restriction on the diver's activity in the future?

3 Considerations

The following concepts are important in the formulation of this guidance:

- ◆ Limb pain decompression illness is very unlikely to have any long term adverse effect on the diver other than a possible increase in the risk of dysbaric osteonecrosis.
- ◆ Neurological decompression illness may be associated with permanent injury to the nervous system despite apparent complete clinical recovery.
- ◆ Failure to make a complete clinical recovery is a clear indication of permanent injury.

It seems likely that cases in which complete recovery is achieved most rapidly may have the least chance of any permanent neurological or other injury. It is recognised that in some circumstances recovery from neurological insult may be very prolonged.

If a diver has suffered permanent neurological injury, their ability to recover from a future episode may be impaired.

Decompression illness may result from exposure to a high-risk dive profile or from individual characteristics, which may act as important risk factors e.g. patent foramen ovale (PFO). Divers who have sustained an episode of decompression illness are likely to be at greater risk of having an episode in the future than the general diving population.

Whether the presence of an inflammatory reaction or other pathological process associated with a recent episode of decompression illness might increase the risk of a further episode during the recovery (healing) process is unknown.

This guidance takes into account the current opinion concerning recovery from other forms of neurological and pulmonary injury.

From a personnel management aspect within the commercial diving industry it is important that there is a degree of consistency in the management of individual cases.

The final decision should be made by a diving medicine specialist taking into account the nature of the incident, the type of diving which may be undertaken in the future and the risk to the diver of serious injury from a future episode. It may require investigation for the presence of individual risk factors. The diver should be made fully aware of the issues involved.

4 Guidance

The following guidance provides recommended **minimum** time intervals for returning to dive after different forms of decompression illness. In some cases longer intervals may be appropriate or necessary in order to complete the investigations required (e.g. injection of bubble contrast for echocardiography may carry an increased risk if conducted shortly after an episode of decompression illness). The recommended minimum time interval begins after completion of successful treatment (when there are no residual manifestations).

- A) Limb pain, or non-specific manifestations only (e.g. persistent headache, excessive fatigue, loss of appetite, nausea)
- With uncomplicated recovery: 7 days
 - After recurrence or relapse requiring further recompression: 14 days
- B) Neurological or pulmonary manifestations
- Sensory disturbance ONLY (paraesthesia or loss of sensation): 28 days
Return to diving only after review by a diving medicine specialist.
 - All other neurological or pulmonary symptoms: 3 months
Return to diving only after review by a diving medicine specialist.
- C) Cutaneous and lymphatic manifestations without neurological involvement, i.e. skin rash with severe itching or marbling (Cutis Marmorata) or swelling of tissues: 28 days
Return to diving only after review by a diving medicine specialist.
- D) Pulmonary barotrauma resulting in a pneumothorax or mediastinal/subcutaneous emphysema. Following appropriate investigation, including HRCT of chest, a diver may be considered fit to return to diving, but no earlier than 3 months after complete recovery.
Return to diving only after review by a diving medicine specialist.
- E) In cases where there are residual neurological manifestations, even after repeated treatment, the diver should be considered unfit for occupational diving.

5 Conclusion

It is the view of DMAC that in the current state of knowledge, there is insufficient evidence to endorse any policy which would automatically disqualify a diver who has made a complete clinical recovery from an episode of neurological decompression illness.

All cases mentioned above as requiring “review by a diving medicine specialist” should be referred to one and the divers concerned should not be allowed to dive until they have received full clearance to do so, in writing.

The diving medicine specialist should consider all the potential causative factors for the DCI and have all the relevant information at his disposal. Consideration should also be given to investigating for individual risk factors and the diver should be fully informed of the potential risks associated with returning to dive and methods of controlling risk.

There is an increased incidence of PFO in divers who have suffered neurological, vestibular or cutaneous DCS. Following neurological DCI, additional screening with high resolution computed tomography (HRCT) thorax is necessary for all cases of pulmonary barotrauma (PBT)/arterial gas embolism (AGE) and those cases in which PBT/AGE might be considered as a possible causal factor.

The references below provide appropriate guidance on investigation by CT thorax and for PFO.

6 References

- ◆ Godden et al. Brit Thoracic Society fitness to dive group. *Thorax* 2003, 58, 3-13
- ◆ Smart D et al. Joint position statement of Persistent foramen ovale (PFO) and diving. *Diving and Hyperbaric Medicine* 2015, 45, 129-131.