
LETTER TO THE EDITOR

To the Editor:

I hope that the retrospective review (1) of U.S. Navy experience with Treatment Table 5 (TT5) will be carefully considered by all who direct the case management of decompression sickness (DCS), be their practice military, commercial, or recreational.

Disenchantment with TT5 surfaced in the early 1970s in oilfield diving circles, with frequent anecdotal reports of incomplete relief and recurrence of symptoms. In this medically and geographically remote setting, treatment table selection was based almost entirely on the patient's complaints and his subjective response to initial therapeutic compression. Objective assessment was the exception rather than the rule. Given the significant incidence of concurrent Type II DCS in divers with Type I complaints, the lack of a pre-recompression neurologic examination is an important omission and clearly violates the treatment algorithm for TT5. The inability of dive team personnel to identify the more serious forms of DCS was considered a major shortcoming within the commercial diving industry (Warner SA. Guest Opening Address. International Diving Symposium, New Orleans, LA, 1979).

On-site recompression facilities have represented something of a paradox. The obvious advantages associated with prompt recompression may be offset by the lack of an adequate medical presence. After development in 1975 of a Diver Medic Technician (DMT) training program (Clarke D. Diver Medics: The First Ten Years. Proc Assoc Diving Contractors, International Diving Symposium, New Orleans, LA, 1984), some diving contractors immediately incorporated the DMT into key diving positions to improve the management of decompression accidents.

Other companies arbitrarily chose to remove TT5 as a therapeutic option; regardless of the degree of involvement or response to recompression, all divers suffering DCS were routinely committed to TT6. Clearly this second approach is overly simplistic and liable to pitfalls. Some examples:

1. The impetus for the diving supervisor to learn even the rudiments of a neurologic examination will be greatly diminished. "Why bother?" has been the reply on more than one occasion, "We are assuming Type II involvement anyway."
2. Slowly resolving or undiagnosed nervous system involvement may not be afforded the benefit of treatment table extensions.
3. There may be premature return of the patient to diving in cases of undiagnosed Type II involvement, with increased risk of further decompression difficulties.
4. Oxygen overdose may cause bubble spillover, particularly in divers who are manifesting indications of pulmonary oxygen toxicity secondary to oxygen breathing during initial decompression or DCS treatment (2).

Green and colleagues have clearly demonstrated the therapeutic value of TT5, when appropriately applied. It should remain a treatment option in both the clinical and field setting. Further, it is incumbent upon those responsible for diver safety to ensure that adequate minimum "first responder" expertise exists at the dive site.

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1. Green JW, Tichenor J, Curley MD. Treatment of Type I decompression sickness using the U.S. Navy treatment algorithms. *Undersea Biomed Res* 1989; 16: 469-470.
2. Butler BD, Hills BA. Effect of excessive oxygen upon the capability of the lungs to filter gas emboli. In: *Proceedings of the seventh symposium on underwater physiology*. Bethesda, MD: Undersea Medical Society, 1981: 95-102.

Dr. Green responds:

Clarke points out many of the pitfalls that may occur during treatment of pain-only decompression sickness (DCS). Use of a longer treatment table when shorter ones are efficacious may obligate the recompression chamber for extended periods of time, interfere with diving operations, and increase the risk of oxygen toxicity for the patient: this risk may already be high because of excitement, heavy exertion, CO₂ retention, or prior oxygen breathing during decompression.

To avoid "shotgun" therapy based on a patient's subjective complaints, it is imperative to thoroughly evaluate a diver who has symptoms that suggest DCS. The practice of treating first and examining later in cases of minor DCS seems unjustified; inadequate initial evaluation can lead either to recompression over-treatment or, more commonly, to undiagnosed and undertreated neurologic involvement.

A patient's complaint of pain-only or other minor DCS calls for a complete neurologic evaluation (mental status, cranial nerves, strength, sensation, coordination, and reflexes) (1). The time lost is more than compensated by proper treatment table selection and by having a baseline examination for subsequent comparison. All subjective symptoms, the dive profile, time of onset of symptoms, the neurologic status, and all other important objective findings should be recorded. Often a neurologic examination will reveal an unrecognized weakness in an extremity, numbness in a dermatome, or even subtle loss of cognitive function. These neurologic deficits can be promptly treated using USN TT6 and, just as important, can be monitored during and after therapy. If Type II symptoms are noted subjectively by the patient, these should be quickly confirmed objectively and USN TT6 promptly initiated; further complete neurologic evaluation can then be performed inside the recompression chamber.

For the special case that only Type I symptoms are noted subjectively and a complete neurologic examination is entirely normal, the patient may be treated safely on USN TT5 provided that the symptoms completely resolve within 10 min of initial recompression. Properly utilized, USN TT5 has shown a 93.3% one-time success rate (1). In all other cases, USN TT6 should be chosen. In the event that a neurologic examination cannot be completed before treatment, a TT6 should be chosen but this should be the exception rather than the rule.

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1. Green JW, Tichenor J, Curley MD. Treatment of Type I decompression sickness using the U.S. Navy treatment algorithms. *Undersea Biomed Res* 1989; 16: 469-470.