Decompression: Truth or Myth? (Part 2)

After the first series of questions and answers, we continue with the “false myths” about decompression.

Many divers believe that the theory of decompression is an exact science. In reality, it’s none other than a simplified mathematical simulation of complex biological phenomena, difficult to represent faithfully. To help divers keep in step with the changes proposed by researchers, we present Part 2 of the quiz.

Diving with breathing mixtures containing high levels of oxygen can damage DNA.

FALSE! As revealed by J. Witte, even if in isolated polymorphonuclear (“culture”) the damage to DNA is correlated to the partial pressure of oxygen, in real dives (“live”) divers who frequently breathe a mixture rich in oxygen report minor damages to DNA compared to divers who breath air. This protective effect no long exists once the interval between repetitive dives is over three weeks.

It is discouraged to practice semi-vigorous physical activity (gym, running, etc) before a dive with high decompression stress level (obligatory decompression stops, multilevel dives beyond the safety curve, etc).

FALSE! Hyperoxygenation, always present while diving, increases the production of free radicals, which are the cause of various diseases. The principal damage generally affects capillary endothelium. Their harmfulness is contrasted by different types of scavengers: enzymes able to interrupt the chain reaction of free radicals. A. Brubakk reported that a single session of semi-strenuous physical activity 24 hours before a dive at high decompression stress level helps fight free radicals and significantly reduces the doppler level of bubbles after diving. However, experimental evidence shows that a single session of semi-vigorous physical activity right before diving increases the amount of micro-bubbles when getting out of the water. It is recommended to follow the 24 hour stop as tested in Brubakk’s research.

It is not recommended to do physical activity after diving.

TRUE! D. Madden examined 23 divers who dived at 18 meters for 47 minutes. A transthoracic echocardiograhy was done immediately after reaching the surface – at rest and after exercise (cycle ergometry) – while observing the potential problems caused by bubbles passing from the venous circulatory system to the arterial system. 3 right-left shunts were detected at rest , with passage of bubbles in the arteries, 12 shunts were detected during exercise, while in 8 divers there were no shunts. When necessary, oxygen administration immediately blocked the shunt, as compared to breathing only air. Exercising facilitated the right-left shunt without increasing the number of bubbles (exercise did not increase bubbles, rather it opened the passages). In conclusion, even light exercise, like swimming from the dive spot back the boat with all the dive gear, can bring on a latent right-left shunt.

It is possible to reduce bubble formation after a dive by implementing preventive methods before the dive.

TRUE! Bubble formation during a dive depends on four factors: accumulation of gas in the endothelium (gas pocket), preconditioning, conditions of the diver and variables of the dive (environmental). J.P. Imbert emphasizes the importance of preconditioning – easily manageable factors. Preconditioning with breathing

oxygen reduces bubble formation. Other preparatory methods are: the sauna, which can regulate neurally mediated vasodilation; vibration, which can regulate vasodilation with nitrogen monoxide; physical exercise, which can regulate vasodilation for both mechanisms (for further information about this issue, read the article "Preconditioning and DCI", published in Alert Diver #51).

If you follow the dive computer's directions and the dive tables, it is impossible to get Decompression Illness.

FALSE! As reported by M. Pieri of DAN DSL, DAN analysed 58.256 dive profiles (75% men and 25% women with an average age of 35.6). The examined dives were at a depth of 5 to 192 metres. In 91,3% the mixture was air; 5,14% nitrox and in 3,56% trimix. A study of the Gradient Factor (GF), understood as the percentage of the value M (maximum saturation tolerated in the most critical compartment, the one that controls the dive) shows that incidents occur in dives with conservative dive profiles (80% GF). By 2013 the study had examined 260 decompression incidents, with an average GF of 0.79 at risk (which means, incidents occur when reaching 79% of the value M, even when following directions from dive computer.)
There was no significant difference between traditional decompression algorithms and algorithms that control bubbles . The average age of the victims was 42 years old. The average depth of the dives where incidents occurred was between 40-45 metres. There was a difference in the incidence of decompression illness between the genders: males 0,03%; females 0,08%. The study shows that incidents are mostly "undeserved", and not caused by human error.

Decompression accidents are therefore a potential risk that all divers must take into consideration.