



## RESEARCH

**Recently our study group focused on the effects of medication under hyperbaric conditions in relation consequences for the diver. The full paper will be published in the Journal of Diving and Hyperbaric Medicine edition June 2019**

### Background

Scuba diving is an increasingly popular sport with more than 15 million divers worldwide completing more than 250 million dives per year.<sup>1</sup> Certification for scuba diving can be obtained through diving certification organizations. These include, for example, the Professional Association of Diving Instructors (PADI) and Scuba Schools International (SSI). This certification typically involves online classes, classroom instruction, pool practice and open-water training. Since physiological changes are induced by immersion, swimming and using special equipment during diving, divers must be fit to dive.<sup>2,3</sup> The laws of physics that are important to take into consideration while diving are Boyle's law, Henry's law and Dalton's law. These laws provide the explanation for the possible occurrences of barotrauma, decompression sickness (DCS), nitrogen narcosis and oxygen toxicity, amongst other pathophysiological impacts of the underwater environment.<sup>4</sup> Although the hazards of diving are principally identical for sport, commercial and military divers, the risks may vary depending on the varying diving procedures and equipment used. Appropriate training, skills and equipment can aid in reducing the risk of diving and, depending on jurisdictions, regular medical assessment is required before diving.

Medical disorders or use of medication may have an impact on the capacity to adapt to hyperbaric conditions and could affect medical fitness to dive.<sup>5</sup> Illnesses, such as asthma or epilepsy, require a medical clearance. However, in most cases evidence of causality is absent and it is not always straightforward to predict the effect of medication on cognitive and physical functioning in hyperbaric conditions. General health, specifics of the disorder, medication interaction or the hyperbaric conditions are all factors in this assessment process.

Obviously, regulations concerning commercial divers are stricter, and illnesses prior to a diving career are a stronger contraindication than onset during a diving career. Many protocols have been written for selecting humans for work under hyperbaric conditions or (recreational) diving, however robust evidence to guide practice is limited.<sup>6-8</sup>

The primary aim of this systematic review of the current human and animal study literature was to assess the interactions between the hyperbaric environment and medications. The secondary aim was to provide a heuristic approach to support decision making regarding physical fitness for occupational health under hyperbaric conditions and (recreational) diving.

## Conclusion

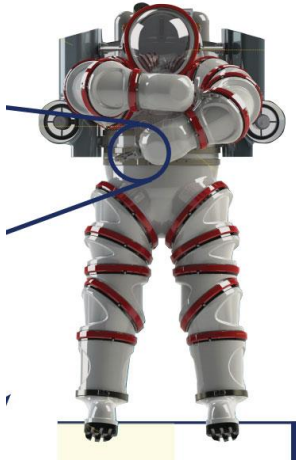
This systematic review revealed no evidence of significant risks due to changes in pharmacologic mechanisms in the hyperbaric environment. However, it is unlikely that hyperbaric conditions diminish any risks of medication encountered in non-hyperbaric conditions. Regarding prevention or treatment of DCS, pharmacologic agents targeted at cardiovascular diseases like aspirin, losartan, clopidogrel or simvastatin could add a potential protective effect although evidence is limited. The anti-depressant fluoxetine may also warrant further investigation. For decision making in prescribing medicine for recreational and occupational divers and to enhance safety by increasing our understanding of pharmacy and diving, future research should focus on human studies in submersed circumstances.

## References

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## INNOVATION

Aquamed B.V. collaborated with major salvage companies on innovation in diving projects. For example in the project “feasibility of an ergonomic atmospheric diving suit” or noise reduction for the prevention of hearing loss in (saturation) divers.



| [Feasibility of an ergonomic atmospheric diving suit](#)