CUHMA ACMHS
Canadian Undersea and Hyperbaric Medical Association
Association Canadienne de Médecine Hyperbare et Subaquatique

E-NEWS

The E-News is the monthly newsletter of CUHMA, the primary outlet to share news/announcements, upcoming events, abstracts of recent publications, job postings, professional perspectives, and images of relevant professional scenes. Submission of applicable content is welcome. New issues are released on the last business day of each month. Past issues are available at https://cuhma.ca. Direct correspondence to info@cuhma.ca.

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NEWS/ANNOUNCEMENTS

CUHMA Virtual Scientific Meeting 2026

CUHMA will hold a one-day online scientific conference on Saturday, May 02. The eight-hour program will bring together an international panel to present a combination of invited reviews and original research presentations. Further details coming soon.

UPCOMING EVENTS

Canadian Underwater Conference 2026

The Diver Certification Board of Canada (DCBC) will hold the Canadian Underwater Conference & Exhibition March 24-26 at the Holiday Inn Toronto International Airport hotel. Visit: https://www.underwaterconference.ca.

UMC Introductory Diving Medicine Course

Undersea Medicine Canada will offer a Level 1 'Introductory Course in Diving Medicine - Fitness to Dive' May 11-15 in Halifax, NS. An optional half-day pre-course will be held May 10 for those wanting additional preparation for the program. Upon successful completion of the course, physicians will qualify as CSA Z275.2-15 Level 1 Diving Medical Examiners and can have their names listed with the Diver Certification Board of Canada (DCBC) to conduct commercial diver medicals in Canada. This 40-h course has been accredited for 35 MAINPRO+ CME credits by the College of Family Physicians of Canada. The registration portal will open on January 15. Contact Dr. Debbie Pestell (drdeb1@ns.sympatico.ca; 902-225-8214) or visit: https://underseamedicine.ca for more information.

RECENT PUBLICATIONS

Beilharz AG, Banham N, Gawthrope I. The incidence of cardiac arrest requiring defibrillation and defibrillation protocols in Australasian hyperbaric units. Diving Hyperb Med. 2025 Dec 20;55(4):338-42. doi: 10.28920/dhm55.4.338-342.

Introduction: Cardiac arrest (CA) during hyperbaric oxygen treatment (HBOT) is exceedingly rare with only a few cases reported. It is unknown if in-chamber defibrillation of a patient has been performed in Australasia. In-chamber defibrillation is potentially dangerous with the risk of fire in an oxygen-rich environment. Australasian Standards prohibit the use of currently available defibrillators licensed for in-chamber use, as they contain lithium batteries. This study aimed to investigate how CA is managed in Australasian hyperbaric medicine units (HMUs) and to establish if there is a need to develop standardised protocols. Methods: A 10-part SurveyMonkey® questionnaire sent to all 15 Australasian HMUs. Questions aimed to ascertain if there were cases where defibrillation during HBOT was indicated and if it was performed. We asked about emergency treatment protocols, defibrillation capabilities and if regular training drills were conducted. We asked if colleagues felt the need to have a uniform treatment protocol across Australasia and invited them to share their emergency protocols. Results: Fourteen responses (93.3%) were received. No clinical cases of in-chamber CA or defibrillation were reported. Examples of emergency treatment protocols were provided by two respondents. Six respondents (43%) stated that regular emergency training drills for CA are performed in their HMU. Eleven respondents (79%) favoured standardised treatment protocols; however, comments suggested that this might be unachievable. Conclusions: CA requiring defibrillation in the hyperbaric medicine context is rare and has not been performed in Australasia. Most HMUs have protocols in place, but they are not universally practiced regularly.

Cracchiolo AN, Palma DM, Saporito EFG, Palazzolo C, Mannino SM, Genco F, Vitale F, Profera L, Raineri SM, Accurso G. Safety of hyperbaric oxygen therapy in patients aged 75 and older: a multicenter retrospective study. Undersea Hyperb Med. 2025 Fourth Quarter;52(4):495-506. PMID: 41429027.

Background: The increasing life expectancy presents new challenges in managing elderly patients requiring

hyperbaric oxygen (HBO_2) therapy. This retrospective study evaluates the safety and adherence to HBO_2 guidelines in patients aged 75 years and older, focusing on side effects and adverse events. Methods: Data from 69 elderly patients treated between 2019 and 2023 at two Sicilian hyperbaric centres were analyzed. Demographics, indications for HBO_2, comorbidities, treatment protocols, and side effects were collected. Pre-treatment evaluations included ENT checkups, ECG, chest X-rays, and laboratory tests. Patients underwent HBO_2 sessions at 2.4-2.8 ATA, with clinical monitoring pre-and post-treatment. Results: 1,799 HBO_2 sessions were performed in 69 patients (mean age 78 years; 59.4% male). The most common indications were progressive necrotizing infections (33.3%), sudden sensorineural hearing loss (17.3%), and chronic radiation-induced tissue injuries (14.5%). Side effects occurred in 14 patients (20.3%), primarily middle ear barotrauma (8.7%), sinus barotrauma (4.3%), confinement anxiety (4.3%), hypoglycemia (1.4%), and chest pain (1.4%). Most side effects were resolved with prompt care, and no life-threatening events were recorded. Adherence to guidelines and meticulous pre-treatment evaluations minimized risks. Conclusions: HBO_2 is a safe therapeutic option for elderly patients when strict pre-treatment evaluations and monitoring protocols are implemented. Despite this population's increased vulnerability, the incidence of side effects was comparable to that in younger cohorts. Future research is warranted to optimize treatment protocols and explore outcomes in larger elderly populations.

Dejonckheere CS, Käsmann L, Schmeel LC, Walter S, Anzböck T, Dreyer S, Sarria GR, Gkika E, Layer JP. Hyperbaric oxygen therapy for chronic radiotherapy-related adverse effects: a clinically focused review. CA Cancer J Clin. 2026 Jan-Feb;76(1):e70058. doi: 10.3322/caac.70058.

Radiotherapy is a cornerstone of modern oncologic care, yet its sequelae can significantly impair survivors' quality of life. Chronic radiation-induced conditions-including skin fibrosis, bone necrosis, radiation cystitis, and proctitis-pose substantial challenges for both patients and caregivers, particularly in the context of improving long-term cancer survival. Hyperbaric oxygen therapy, characterized by the promotion of angiogenesis, fibroblast activation, and tissue remodeling in hypoxic environments, has emerged as a potential adjunctive treatment for mitigating these late effects. Herein, the authors critically evaluate randomized trials, cohort studies, and real-world data while highlighting gaps in knowledge, including patient selection, optimal treatment protocols, and long-term outcomes. In addition, they discuss practical considerations and health system implications of the integration of hyperbaric oxygen therapy into survivorship care. The objective of this review is to provide clinicians with an evidence-informed framework to guide decision making in the multidisciplinary management of radiation-related late effects.

Ekman L, Sjöblom C, Ekström M, Frånberg O. Increased ventilatory response to carbon dioxide after dive training. Undersea Hyperb Med. 2025 Fourth Quarter;52(4):587-597.

Introduction: Divers are reported to have a lower ventilatory response to elevated levels of carbon dioxide (CO_2) than non-divers. Hypoventilation with CO_2 retention during diving is potentially dangerous. It is unknown if CO_2 retention is largely inherited or develops during diving training. We aimed to investigate if a military dive training course would influence the ventilatory response to CO_2. Methods: Novice rebreather Divers with Amphibious Rangers as controls were tested at baseline, after 12 weeks of water exercise training, and after 15 weeks of diving: participants rebreathed in a Douglas bag filled with an initial 100% oxygen, resulting in increasing levels of inspiratory CO_2 (iCO_2). The test was performed until symptom-limitation or an expiratory CO_2 of 8.0 kPa. To decrease conscious control of breathing, participants were distracted with a memory game during the test. Differences between groups and over time were analyzed using independent and paired t-tests. Results: Ten Divers and six Amphibious Rangers completed baseline testing and eight Divers completed all tests. Divers had a statistically significant higher minute ventilation (V_E) after dive training, compared to after water exercise training and baseline, at all levels of iCO_2. However, the change in Hypercapnic ventilatory response (HCVR) before and after dive training across pCO_2 values 5.0-7.9, did not reach statistical significance. At baseline, Amphibious Rangers had a non-significant higher V_E compared to Divers at higher levels of iCO_2. Conclusion: A military rebreather diving program might be associated with increased ventilatory response to CO_2.

Elving-Kokke KH, Germonpré P, Sas-Meertens MAV, Visser ES. Experience of scleral lens wear while self-contained underwater breathing apparatus diving. Eye Contact Lens. 2025 Dec 31. doi: 10.1097/ICL.0000000000001257. Online ahead of print.

Objectives: To evaluate the experiences of wearing scleral lenses while self-contained underwater breathing apparatus (scuba) diving in a large number of dives. Methods: An anonymous online survey for diving scleral lens wearers worldwide was distributed. The data were collected between May 2019 and November 2022. The survey sought responses on participants' age and sex, scuba dive-related characteristics and scleral lens wear-related questions, and eye-related symptoms after the dive. Results: A total of 67 scleral lens wearers completed the questionnaire (63% male). A median of 150 dives were performed while wearing the scleral lenses, with 26,360 dives in total. Seven participants experienced more redness, and five had less clear eyes after the dive. Two

adverse events in 2 of 26,360 dives (0.007%) were reported by two participants. The scleral lens was more cloudy during diving in four subjects, two experienced a more cloudy scleral lens after diving, and the scleral lenses were more deposited after diving in three subjects. During seven dives of seven unique divers, a scleral lens was lost. After the dive, 10 divers experienced more tightness of the scleral lens on removal, whereas eight found them easier to remove. Conclusions: Scleral lens wear while scuba diving seems to cause few complications and seems relatively safe.

Gouin E, Dugrenot E, Lance RM, Michot T, Marroni L, Tillmans F. Perceptions of airway protection tools: an international survey on the use of mouthpiece retaining straps in closed-circuit rebreather diving. Diving Hyperb Med. 2025 Dec 20;55(4):369-75. doi: 10.28920/dhm55.4.369-375.

Introduction: Rebreather diving carries a high fatality rate (estimated 1.8-3.8 deaths per 100,000 dives), yet its popularity is growing. Among 54 French military divers who lost consciousness underwater, none died when using a mouthpiece retaining strap (MRS) in a team diving setup. Despite this, MRS use remains limited among recreational divers for whom drowning is a major cause of death. This study assessed knowledge, perceptions, and training regarding MRS use within the rebreather diving community. Methods: An international online survey targeting certified rebreather divers was disseminated via social media. The survey gathered demographic information, diving experience, MRS usage, and details on related training. Results: A total of 563 responses were collected. Of these, 133 (23.6%) were instructors, and 210 (37.3%) had received MRS training. On a 0 to 100 scale, divers trained on MRS use rated MRS importance higher (median score: 74 [IQR 33-90]) than divers with no MRS training (median: 49 [IQR 16-67]). Barriers to MRS adoption included negative past experiences, poor training, misuse, and concerns about complications during bailout procedures. Conclusions: While not widely adopted among recreational divers, the MRS is supported by strong safety data. Formal training significantly improves its perceived value and acceptance. Greater involvement from manufacturers, training agencies, and instructors is essential to promote education and encourage MRS adoption as a key safety measure in rebreather diving.

Lin N, Yu E, Lussier A, Gouin E, Lindholm P. Use of in-water recompression for decompression illness after deep freediving: a case series. Diving Hyperb Med. 2025 Dec 20;55(4):376-83. doi: 10.28920/dhm55.4.376-383.

Introduction: There are increasing anecdotal reports of in-water recompression in freedivers who surface with neurological symptoms, likely suffering from decompression illness (DCI). Given the remote locations where many cases occurred, divers often struggled to access medical care, including the gold-standard hyperbaric oxygen treatment (HBOT), thus resorting to in-water recompression (IWR). Currently, IWR guidelines have only been discussed for scuba and surface supplied divers in specific scenarios, with protocols prescribing oxygen breathing at depths ≤9 metres maximum for around 1-3 hours. Methods: We conducted detailed interviews with six competitive freedivers on signs, symptoms, management, and resolution of 13 cases of DCI. We additionally requested records of medical evaluation and treatment, with their consent. Results: Three cases were suggestive of decompression sickness, six were consistent with arterial gas embolism, and four were ambiguous. Six cases were treated with IWR for 20-90 min at 5-25 metres with partial to complete resolution of symptoms. Four of these cases received HBOT afterwards. One diver reported significant permanent disability. Divers made several regimen changes after these incidents, including staying well-hydrated, reducing lung-packing, slowing their ascent rate, and/or employing prophylactic IWR when diving beyond a specified depth. Conclusions: Given the remote locations of many incidents, freedivers often faced challenges in accessing HBOT. Self-treatment with IWR was widely used, either as a bridge to HBOT or as a standalone remedy. IWR poses potential risks, especially at the deeper depths reported in this study. This treatment modality is being utilised sometimes without medical oversight and recommended guidelines for IWR for freedivers should be developed.

Nyugen NB, Van TN, Hai HNT, Truong SN. Results of treating patients with diabetic foot ulcers with hyperbaric oxygen. Int Marit Health. 2025; 76, 4: 259–67.

Background: Diabetic foot ulcers (DFU) are a common and severe disease with vascular and/or neurological complications, affecting the patient's health and quality of life. Hyperbaric oxygen (HBO) is a non-drug treatment method that has anti-inflammatory effects, reduces edema, increases neovascularization, increases the synthesis of collagen fibers, and accelerates the wound healing process. This study aims to evaluate the results of treating patients with diabetic foot ulcers with HBO. Material and methods: A randomized controlled study was conducted. A total of 94 patients was diagnosed with diabetic foot ulcers, and treated at the Institute of Maritime Medicine from January 2021 to December 2023. Study subjects were divided into 2 groups: the study group included 43 patients treated with HBO combined with intravenous antibiotics, wound care, and control of underlying disease; the reference group included 51 patients who were not treated with HBO, but were treated with intravenous antibiotics, wound care, and control of underlying disease. Results: The infection status and level of granulation tissue growth of the study group were better than the reference group ($p<0.001$); the depth and diameter of the ulcer in the study group decreased

compared to the reference group ($p<0.05$). Treatment time and amputation rate in the study group were reduced in comparison with the reference group: 10.1±4.6 days, 15.1±7.8 days and 4.6%, 11.7%. Conclusions: Hyperbaric oxygens a good method for treating diabetic foot ulcers, helps with anti-inflammation, stimulates the growth of granulation tissue, quickly heals ulcers, reduces treatment time, and reduces amputation rates.

Paganini M, Moon RE, Camporesi EM, Bosco G. Advances in breath-hold diving research: a state-of-the-art review. Eur J Appl Physiol. 2025 Dec 19. doi: 10.1007/s00421-025-06093-6. Online ahead of print.

Background Breath-hold diving (BHD, also referred to as freediving) represents an extreme physiological challenge, requiring adaptations to rapid changes in blood gas levels and hydrostatic pressure. Despite advances in understanding human responses to BHD, knowledge gaps remain. With this state-of-the-art review, research trends and progression were tracked to inform future investigation directions. Methods A structured literature search was conducted in PubMed and Scopus (2005–2025), selecting peer-reviewed studies on physiological, biochemical, and biomechanical aspects of BHD. Thematic analysis identified eight major research areas: cardiovascular, pulmonary, and neurological systems, decompression stress, skeletal muscle and metabolism, training, longterm adaptations, and technological advancements. Results Cardiovascular adaptations involve autonomic regulation, bradycardia, and splenic contraction, but uncertainties remain regarding individual variability. Pulmonary responses include lung compression, gas exchange inefficiencies, and potential risks of lung barotrauma. Neurological effects include hypoxia-induced syncope, cerebral blood flow changes, and emerging evidence of neurovascular damage. Decompression stress, once considered negligible, is now recognized in elite and repetitive divers. Training enhances apnea performance through hematological and metabolic adaptations, though longterm effects are unclear. Telemonitoring advancements are promising for future improvement of divers' safety. Conclusions Recent observations emphasize both adaptive and maladaptive aspects of BHD physiology. The synthesized research trends should aim at refining current achievements and identify what individual and environmental factors pose specific limits for human breath-hold performance underwater.

Schipke JD, Limper U, Tetzlaff K. Breath-hold diving and decompression sickness. Am J Med. 2025 Dec 13:S0002-9343(25)00833-2. doi: 10.1016/j.amjmed.2025.12.015. Online ahead of print.

Decompression sickness (DCS), traditionally associated with scuba diving, increasingly occurs in breath-hold diving, particularly during repetitive shallow or deep dive profiles. This comprehensive review synthesizes 85 records documenting 244+ cases across 75 years, including historical Taravana syndrome in Polynesian pearl divers and cases among Japanese Ama, Korean Haenyeo, recreational freedivers, instructors, and spear fishers. Unlike scuba-related DCS, breath-hold DCS predominantly manifests as cerebral symptoms that can mimic stroke or transient ischemic attack, often presenting in young, healthy individuals. Key risk factors include inadequate surface intervals during repetitive shallow dives, deep dives exceeding 40 m, rapid ascent rates, and individual physiological factors including patent foramen ovale. Despite growing freediving popularity with an estimated one million participants globally, DCS remains underrecognized and underreported. Early recognition is critical, requiring high clinical suspicion in divers presenting with neurological symptoms. Immediate high-flow oxygen and urgent hyperbaric oxygen therapy remain essential treatments. This review emphasizes the need for enhanced education among both divers and medical professionals to improve prevention, recognition, and management of this potentially devastating condition.

Spiegel JL, De Biasio MJ, Sampieri G, Ungar OJ, Bajin MD, Lin VYW, Chen JM, Idestrup C, Tarshis J, Le TN. Adjunctive hyperbaric oxygen therapy or intratympanic steroids in sudden sensorineural hearing loss? Laryngoscope. 2025 Dec 23. doi: 10.1002/lary.70327. Online ahead of print.

Objectives: The pathophysiology of sudden sensorineural hearing loss (SSNHL) is still unknown, and therefore treatment strategies are often debated. Traditionally, SSNHL is treated with steroids, either orally (OCS) and/or via intratympanic injection (ITSI). Hyperbaric oxygen treatment (HBOT) has resurged in popularity as an adjunctive therapy. The present study investigated the additive effect of HBOT to traditional steroid treatment for SSNHL. Methods: Retrospective study comparing treatment effect (pure tone average-PTA; speech recognition threshold-SRT; word recognition score-WRS) between HBOT+ITSI and ITSI treated patients. Sub-analysis of responders and nonresponders, treatment delay, and number of injection/dives. Results: One hundred nineteen patients were divided into ITSI (n=73) and HBOT+ITSI (n=46) groups. While there was a significant pre-to-posttreatment improvement in PTA, SRT, and WRS ($p<0.001$) within each group, there was no difference between groups in pre-to-postimprovement for PTA, SRT, or WRS ($p=0.49$, 0.07, or 0.55, respectively). Of responders to treatment, 4.1% did not receive OCS compared to 24.4% of nonresponders ($p<0.001$). In HBOT responders, audiogram improvement was demonstrated within 10.9±6.5 (max 23) sessions. 25.8% of HBOT responders showed no response after completing ITSI and then subsequently demonstrated audiometric response after 17.5±4.0 HBOT dives. Conclusion: No additional treatment benefit was found with adjunctive concurrent

HBOT. HBOT might be of value to patients refractory to steroid treatment. No beneficial treatment effect in receiving more than 23 HBOT dives was observed. However, evaluating treatment effect in SSNHL loss is always biased by the well-known confounders that are linked to the condition.

Tettelbach WH, Hart BB. Refractory osteomyelitis. Undersea Hyperb Med. 2025 Fourth Quarter;52(4):641-68. PMID: 41429042.

Chronic refractory osteomyelitis, according to the Centers for Medicare & Medicaid Services' (CMS) National Coverage Determination (NCD) 20.29, is an identified condition covered for treatment with adjunctive hyperbaric oxygen (HBO_2) therapy. Within the NCD (20.29) chronic refractory osteomyelitis is outlined as being unresponsive to conventional medical and surgical management [1]. From a practical perspective, patients can be appropriately diagnosed with chronic refractory osteomyelitis when they demonstrate no significant improvement or demonstrate worsening of the underlying osteomyelitis despite 30 days of combined conventional surgical and medical treatment that included systemic antimicrobial therapy. To date, no conclusive randomized clinical trials examining the effects of HBO_2 therapy on refractory osteomyelitis exist. Additionally, many of the initial studies that resulted in positive outcomes were conducted in hospital settings safeguarding compliance, and thus, not unexpectedly, the outcomes have not translated exactly to the outpatient clinic setting. Nonetheless, based on a comprehensive review of the scientific literature, the addition of HBO_2 therapy to routine surgical and antibiotic treatment of previously refractory osteomyelitis appears to be both safe and ultimately improves infection resolution rates. In most cases, the best clinical results are obtained when HBO_2 treatment is administered concomitantly with culture-directed antibiotics and initiated soon after clinically indicated surgical debridement. In situations where extensive surgical debridement or removal of fixation hardware is relatively contraindicated (i.e., cranial, spinal, sternal, or pediatric osteomyelitis), a trial of systemic culture-directed antibiotics and HBO_2 therapy prior to undertaking more than limited surgical interventions provides a reasonable prospect for osteomyelitis cure.

Tuominen L, Lundel R, Balestra C, Wuorimaa T, Koponen L, Sokolowski S, Räisänen-Sokolowski A. Effects of fluid loss on the physiology of closed-circuit rebreather divers after 100- and 45-metre dives. Diving Hyperb Med. 2025 Dec 20;55(4):391-7. doi: 10.28920/dhm55.4.391-397.

Introduction: Diving induced immersion diuresis predisposes divers to dehydration. Dehydration is considered a risk factor for decompression sickness (DCS) but there is very little evidence to prove it. Dehydration also potentially modifies venous gas emboli (VGE) formation and impairs endothelial function. The purpose of this study was to report the effects of fluid loss during a dive on the diver's physiology. Methods: Nine divers performed a 45-metre fresh water (mfw) and a 100 mfw dive with predetermined dive profiles. Body weight was measured before and after the dive. Post-dive detection of VGE was performed according to the extended Eftedal-Brubakk scale. We also measured haematocrit and flow mediated dilation before and after the 100 mfw dives. Results: After a 68-minute dive to 45 mfw, median weight loss was -1.1 kg, (IQR -1.2, -1.0; range -2.0, -0.6), P=0.009 and VGE were detected in all divers. After a 170-minute dive to 100 mfw, median weight loss was -1.5 kg (IQR -1.8, -1.1; range -2.2, -0.8), P=0.009 and VGE were detected in seven divers. Weight loss after the dive was statistically significant and there was a negative correlation between weight loss and bubbling after the 45 mfw dives. None of the divers suffered any symptoms of DCS. Conclusions: We found significant weight loss after both decompression dives but there were no clinical DCS symptoms in any of the divers. This study does not offer new evidence supporting the notion that dehydration increases decompression stress in divers.

Voigt A, Laspro M, Thys E, Jethanamest D, Chiu ES. Systematic review of otologic adverse events in hyperbaric oxygen therapy. Undersea Hyperb Med. 2025 Fourth Quarter;52(4):537-47. PMID: 41429031.

Objectives: Hyperbaric oxygen (HBO_2) Therapy has been associated with some risks and adverse events. Previous studies examining otologic complications from HBO_2 therapy vary in their reported incidence of adverse events. This study aims to systematically review the otologic complications associated with HBO_2 therapy and investigate contributing risk and protective factors. Review method: A systematic review was conducted to identify studies reporting otologic adverse effects due to HBO_2 therapy. Utilizing PRISMA 2020 guidelines, titles and abstracts were screened before conducting a full-text analysis. Studies reporting the incidence of otologic complications and studies reporting risk or protective factors for otologic complications were included. Results: A search for articles on HBO_2 therapy otologic complications yielded 2,027 articles, of which 183 were relevant to the research question. Ultimately, 54 studies met the inclusion criteria. Fifteen percent of the 18,284 patients treated with HBO_2 therapy experienced adverse events. Of the middle ear barotrauma (MEB) that occurred, 42.8% was mild, and 6.4% was severe. The major risk factors were increasing age, female sex, head and neck pathology, sensory neuropathy, and pre-treatment difficulty equalizing ear pressure. The main protective factor was experience with effective equalization techniques. Conclusions: 15% of patients experienced otologic complications due to HBO_2 therapy. Older age, female sex, and a history of head and neck or neurological

conditions may increase the risk for MEB. Increased monitoring of higher-risk patients during initial treatment sessions and proper equalization techniques may help prevent MEB during HBO_2 therapy. This is the most comprehensive systematic review on the topic to date.

Wang Y, Wang Y, Li S, Ai D, Chen Y, Jing M. Case Report: Successful treatment of severe type II decompression sickness characterized by multiple gas emboli. Front Med (Lausanne). 2025 Dec 5;12:1690176. doi: 10.3389/fmed.2025.1690176. PMID: 41426572; PMCID: PMC12714909.

Editor's note: This paper offers a rare glimpse into Chinese decompression requirements. The report describes a working dive with a bottom time of 120 min on air at 19 m requiring 34 min of decompression (with no statement on a change in gas breathed during decompression). DCIEM tables require 61 min of decompression breathing air. US Navy tables require 145 min breathing air or 44 min breathing oxygen.

Background: Decompression sickness (DCS) is usually caused by inadequate decompression. Although adherence to decompression protocols can significantly reduce the incidence of DCS, it still cannot prevent all cases from occurring. If a large number of gas bubbles enter the right heart and pulmonary arterial system, patients may present with symptoms such as cough, tachypnea, chest pain, dyspnea, or even shock. The presence of numerous bubbles in the abdominal cavity and portal venous system may also lead to liver dysfunction or abdominal pain. Theoretically, DCS occurring after dives that follow decompression tables should be relatively mild. The development of severe Type II DCS characterized by multiple gas emboli following protocol adherence is considered rare. Case presentation: We report a case of a diver who developed severe Type II DCS characterized by multiple gas emboli despite conservative adherence to a decompression protocol. The maximum dive depth was 19 meters, with a total dive duration of 120 min. His underwater task involved heavy lifting, and he performed decompression conservatively according to the Chinese Air Diving Decompression Table for decompression, with a total decompression time of 45 min. However, 30 min after surfacing, the patient developed symptoms including chest tightness, shortness of breath, dyspnea, fatigue, and pain in the left knee and thigh. Computed tomography (CT) scans of the chest and abdomen revealed gas emboli in multiple locations, including the pulmonary artery, right ventricle, and hepatic portal vein. The patient recovered completely after timely recompression therapy and was discharged. Conclusion: This report highlights the unpredictability of DCS; even when decompression tables are followed, severe Type II DCS may occur if the diver's underwater workload is excessive and multiple risk factors are present. Prompt recompression therapy is crucial to prevent clinical deterioration. Due to the limitations of current DCS models, further research is needed to develop individualized safe decompression protocols based on physiological variables.

Yoo YJ, Cléroux A, Pollock NW, Boet S. Quality of reporting in hyperbaric medicine clinical trials: a cross-sectional study. Diving Hyperb Med. 2025 Dec 20; 55(4): 352-68. doi: 10.28920/dhm55.4.352-368. PMID: 41364859.

Introduction: Research in hyperbaric oxygen (HBO) medicine is growing, but the quality of HBO studies is variable. Low study quality may compromise evidence-based decision-making and clinical translation. Methods: This cross-sectional study examined the adherence of 50 randomly selected HBO clinical trials (25 randomised controlled trials [RCTs] and 25 observational studies) to relevant core reporting guidelines: consolidated standards of reporting trials (CONSORT), non-pharmacologic treatments (NPT), and strengthening the reporting of observational studies in epidemiology (STROBE). Studies published in peer-reviewed journals between January 2018 and May 2023 and indexed on PubMed were analysed. Reporting quality was classified as 'excellent' (>85% of guideline items adequately reported), 'good' (50-85%), or 'poor' (<50%). Results: The sample represented 29% of RCTs and 16% of observational studies for the timeframe assessed. No study was rated as 'excellent' for completeness, 28 (56%) were rated as 'good', and 22 (44%) as 'poor'. In RCTs, only one study (4%) adequately reported protocol adherence and eight studies (32%) reported blinding procedures. The NPT checklist showed that key items, including care provider adherence (0 studies) and participant adherence (one study; 4%), were frequently not reported. For observational studies, basic design elements were adequately reported, but with significant gaps in bias management (nine studies; 36%) and missing data handling (13 studies; 52%). Only six studies (12%) mentioned the use of reporting guidelines. Conclusions: Our results showed that quality of reporting of HBO studies is suboptimal. These findings highlight the need for increased awareness and implementation of reporting guidelines, as well as the potential development of HBO-specific guidelines.

Yu E, Lin N, Lindholm P. Decompression illness in breath-hold divers: insights from an online survey. Diving Hyperb Med. 2025 Dec 20;55(4):384-90. doi: 10.28920/dhm55.4.384-390.

Introduction: Breath-hold divers can surface with neurological symptoms consistent with nitrogen buildup in tissues or gas entry into the arterial circulation, collectively termed decompression illness (DCI). While DCI has historically been attributed to diving with compressed air, breath-hold divers have reported similar syndromes. The causes, diagnosis, and management of DCI in breath-hold divers is poorly understood. Methods: We developed an

online survey that queried breath-hold divers on the symptoms they experienced during decompression illness events and the medical management of each event. Results: A total of 36 (31 M, 5 F) breath-hold divers filled out the survey. A majority identified as recreational freedivers, competitive freedivers, and/or spearfishers with an average age of 45 years and 18 years of breath-hold diving experience. Of those surveyed, 33 (92%) held a certification from an accredited training agency. A total of 18 (50%) reported experiencing DCI, with 21 DCI incidents reported by 13 individuals from 1999-2024. Sixteen (76%) of DCI incidents occurred during training, with an average depth of 83.4 m and average speed of 1.0 $m \cdot s^{-1}$. Thirteen (62%) percent of DCI incidents occurred while diving to depths shallower than a previous personal best. The most common symptoms were weakness, numbness, slurred speech, and fatigue. The most common treatment modalities were surface oxygen, in-water recompression, and hyperbaric oxygen therapy. Sixteen divers (76%) had partial or complete resolution of their symptoms. The top cited contributors to the DCI incidents were depth, short surface interval between dives, and pulmonary barotrauma. Conclusions: Breath-hold divers can experience DCI even when diving within their limits. The most cited contributors to DCI were depth, short surface interval between dives, and pulmonary barotrauma. Most divers' symptoms resolved after treatment with surface oxygen, in-water recompression, and/or hyperbaric oxygen therapy.

Zarzecki M, Zawadzka I, Mitera B, Wojewódzka-Żelezniakowicz M, Konopińska J. Hyperbaric oxygen therapy for branch retinal artery occlusion: a case series. Cureus. 2025 Nov 13;17(11):e96804. doi: 10.7759/cureus.96804. eCollection 2025 Nov.

Retinal artery occlusion (RAO) is an ophthalmic emergency primarily caused by systemic cardiovascular diseases. Central RAO (CRAO) may lead to severe visual loss, whereas branch retinal artery occlusion (BRAO) is associated with more benign symptoms and often resolves with less severe visual dysfunction. The etiopathogenesis of RAO is similar to that of ischemic stroke. It involves sudden occlusion of the retinal artery, leading to ischemia of the inner layers of the retina, retinal infarction, permanent damage to sensory cells, and resultant irreversible loss of vision. Although small-sample studies on the treatment of CRAO are available, only a few case series and reports on the efficacy of hyperbaric oxygen therapy (HBOT) in BRAO have been published. In this case series, we aimed to evaluate the effectiveness of HBOT in improving visual acuity in patients with BRAO based on an analysis of selected case reports. Patients underwent HBOT at 5, 36, and 48 hours after the onset of ocular symptoms, and visual acuity improved both quantitatively and qualitatively. HBOT has beneficial effects on the final visual acuity of patients following an episode of BRAO and may be a rescue treatment for early-stage BRAO, particularly when reperfusion is still feasible.

CUHMA-ACMHS is the Canadian voice for the advancement of hyperbaric and diving medicine throughout our country and beyond. Our activities include continuous medical education for physicians, nurses, respiratory therapists and anyone involved in the fields of hyperbaric and diving medicine. We are also promoting dissemination of clinical research, publishing position statements, liaising with related professional associations and government agencies. Our main goal is advocating on behalf of our patients. Our vision is to be the reference for the development and delivery of hyperbaric and diving medicine in Canada and beyond. Our mission is to promote excellence in hyperbaric and diving medicine through leadership in education, promotion of best practices and advocacy for our patients. Our values are excellence, leadership, collaboration, communication, and integrity.

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