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

E-NEWS

EDITORIAL NOTE − November 2026

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 Board of Directors Elections 2026

The nomination period for the board of directors election is open from October 05 (0800 Eastern time) through December 07 (0800 Eastern time). Nominations (of other or self) should be sent to info@cuhma.ca. Open positions include president-elect, president, vice-president, secretary, treasurer, and director-at-large. Online voting will run from December 09 (0800 Eastern time) through Wednesday December 16, 2026 (2359 Eastern time). Further details will be shared in a separate communication and in the December E-News.

UPCOMING EVENTS

Canadian Underwater Conference 2027

The Diver Certification Board of Canada (DCBC) will hold the Canadian Underwater Conference & Exhibition April 04-07 at the College of Carpenters and Allied Trades, 222 Rountree Dairy Road, Woodbridge, ON. Visit: https://www.underwaterconference.ca.

UMC Introductory Diving Medicine Course 2027

Undersea Medicine Canada will offer a Level 1 'Introductory Course in Diving Medicine - Fitness to Dive' June 07-11 in Halifax, NS. An optional half-day pre-course will be held June 06 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

Çevik SG, Ozbek M, Simsek M, Taşkın G, Orak MS, Artunay O. Time-dependent efficacy of hyperbaric oxygen therapy in central retinal artery occlusion. Undersea Hyperb Med. 2026 Third Quarter;53(3):471-480. PMID: 42826426.

Introduction: To determine the effect of the timing of hyperbaric oxygen (HBO_2) treatment on functional and structural outcomes in central retinal artery occlusion (CRAO). Methods: This single-center retrospective cohort study analyzed 101 eyes with CRAO treated with HBO_2. Eyes were stratified by symptom-to-treatment interval: ≤12 hours (Group 1), 12-24 hours (Group 2), 24-36 hours (Group 3), and >36 hours (Group 4). Best-corrected visual acuity (BCVA-logMAR), central macular thickness (CMT), and inner retinal hyperreflective band thickness (IRHBT) were recorded at presentation, week 1, and month 6. Results: Presentation BCVA was 2.16±1.04, improving to 1.77±1.02 at month 6 (p=0.03). The mean BCVA gain was greatest in Group 1: -0.85±0.96, and declined markedly with delayed treatment initiation (Group 2: -0.48±1.38; Group 3: -0.10±1.50; Group 4: -0.08±1.77). In Group 1, the mean BCVA improved significantly from 2.04±0.78 logMAR at presentation to 1.19±0.56 logMAR at the 6-month follow-up (p=0.02). Early treatment was also associated with more pronounced reductions in CMT and IRHBT, whereas anatomical changes were negligible when therapy was initiated beyond 24 hours. Baseline CMT and IRHBT showed modest but significant correlations with final BCVA (r=0.37, p=0.03, and r=0.34, p=0.04, respectively). Discussion: HBO_2 provides a significant, time-sensitive benefit for CRAO; initiating treatment within 12-24 hours maximizes recovery and retinal remodeling, validating HBO_2 as a critical adjunct and necessitating rapid triage in ophthalmic emergencies.

Ergözen S, Gökdoğan O, Örmeci N, Karagöz Ç. Reverse sinus barotrauma with periorbital emphysema as an occupational hazard - a case report. Int Marit Health. 2026 Oct 9. doi: 10.5603/imh.110399. Epub ahead of print. PMID: 42852468.

Sinus barotrauma is the second most common diving injury among divers. It results from an imbalance between the pressure within the sinuses and the ambient pressure. It may occur not only as "barotrauma of descent" but also as "barotrauma of ascent/reverse barotrauma," which is less common. Here, we describe a professional diver who had worked at a fish farm for nearly 3 years, diving with scuba equipment, and developed reverse sinus barotrauma with periorbital emphysema. This diving injury is preventable. To help prevent it, divers must have adequate education and knowledge of diving physics, physiology, and injuries. They should also be aware of their health status and whether they are fit to dive on a given day. If in doubt, they should cancel the dive. If they are unable to equalize the pressure difference and/or experience sinus pain, they should stop descending, abort the dive, and seek medical evaluation and treatment.

Evanger K, Vaagbø G, Haugen OH, Müller B. Myopic shift in patients during hyperbaric oxygen treatment: a systematic review. Undersea Hyperb Med. 2026 Third Quarter;53(3):481-494. PMID: 42826427.

Introduction: Reversible myopic shift (MS) is a common side effect of hyperbaric oxygen treatment (HBO_2) resulting from refractive changes in the lens. Single studies indicate that the myopic shift increases with longer duration of HBO_2 and may differ between hyperbaric chamber types and oxygen breathing systems. This review aims to improve knowledge on the frequency and magnitude of myopic shift after standard-length HBO_2. Methods: A systematic search for original studies of myopic shift after HBO_2 was conducted in medical databases. Included were published full-text articles in English with specified details on oxygen administration, pressure, number of treatments, and use of conventional techniques to measure refraction. Studies with exposure other than HBO_2, patients with artificial lenses, and single-case reports were excluded. Results: Of 153 reports identified, eight studies with 263 patients were included. Treatment durations covered 18-21, 30, and 40 treatments in either monoplace or multiplace chambers using hoods or masks. For the mean values of myopic shift and the incidence of a myopic shift ≥0.5 D, a range was seen from the lowest values after 20 treatments in multiplace chambers using a mask (0.4 D and 53%, respectively), to the highest values after 40 treatments using hoods (1.6 D and 100%, respectively). For monoplace treatment, the corresponding numbers were 0.6 D and 70% after 18 treatments, and 0.95 D and 91% after 30 treatments. Discussion: This review indicates that both the magnitude and incidence of myopic shift increase with the number of HBO_2 sessions and in the order multiplace-mask <monoplace <multiplace-hood.

Kim M, Lee WD. Decompression theory and models for diving operations: a review of principles, algorithms, and applications. J Ocean Eng Technol. 2026. doi: https://doi.org/10.26748/KSOE.2026.038.

Decompression sickness (DCS) has been a persistent safety concern in diving operations since its recognition among 19th-century caisson workers. This review consolidates the theoretical foundations and historical development of decompression theory, from Dalton's and Henry's laws to representative algorithms used in contemporary diving practice. Dissolved-gas models, including Haldane's tissue-compartment theory, Workman's M-value framework, Bühlmann ZH-L algorithms, and Thalmann exponential–linear models, along with the gradient factor approach, are reviewed together with bubble-based approaches, including the thermodynamic model, varying permeability model, and reduced gradient bubble model. Their core assumptions, mathematical formulations, and operational implications are examined in a unified framework. A comparison of a 40-m air dive with a 30-min total bottom time showed that total decompression time differed by up to 3.6-fold among algorithms, reflecting differences in model assumptions, conservatism settings, and implementation-specific characteristics rather than any inherent superiority of a particular algorithm. The review further discusses implications for dive planning under dynamic marine conditions and integrated diver and remotely operated vehicle operations. This narrative review provides a consolidated reference for informed algorithm selection and safer dive planning across recreational, technical, commercial, military, and marine salvage and rescue diving contexts.

Körpinar Ş, Esen E, Siddikoğlu D, Aylanç N. Prevalence of dysbaric osteonecrosis in professional divers and analysis of influencing factors. Undersea Hyperb Med. 2026 Third Quarter;53(3):423-432. PMID: 42826421.

Introduction: Dysbaric osteonecrosis (DON) is an occupational hazard that can lead to joint deformity in professional divers who represent the young workforce. This study aimed to determine the prevalence of DON in professional divers and to investigate the factors that would justify requests for magnetic resonance imaging (MRI) as part of periodic fitness-to-dive examinations, particularly in asymptomatic cases. Methods: In this retrospective study, medical records and imaging data of 120 professional divers who underwent routine fitness-to-dive evaluations between June 2018 and March 2024 were reviewed. Both X-rays and MRI scans were assessed for signs of osteonecrosis. Demographic data, diving profiles, clinical history, and biochemical parameters were analyzed to identify potential risk factors associated with DON. Results: Dysbaric osteonecrosis was identified in 10 out of

120 divers (8%). The most affected anatomical region was the right humerus. MRI detected 9 of 10 DON cases, while X-rays identified only one. Statistically significant risk factors for DON included a cumulative diving duration exceeding 900 hours, weekly diving time over 15 hours, diving depths beyond 35 meters, and diving experience greater than 9.5 years. A previous history of decompression sickness (DCS) and a prior diagnosis of DON were also strongly associated with current lesions. MRI demonstrated significantly higher sensitivity compared to radiography ($p<0.0001$). Discussion: MRI is considerably more sensitive than conventional radiography in detecting DON, particularly in its early stages. Routine MRI screening may be beneficial for divers with prolonged or intense diving exposure or a history of decompression-related complications, enabling early diagnosis and timely intervention to prevent long-term sequelae.

Montseny JP, Foret A. Maximum density of breathing gases used for open-and closed-circuit diving. Worldivers Research & Reports, 2026; 11 pp.

In diving, the maximum density of the breathing gas for open-circuit diving is between 8 and 9 g/L. Gavin Anthony and Simon Mitchell proposed reducing this to 5.2-6.2 g/L for both closed-circuit and open-circuit diving. Although these threshold values have not been validated, they have been incorporated into dive computers and have served as the basis for diving standards. In this article, we present the elements needed to understand the origin of these values and their scope of application. As things stand, we do not believe that these proposed new thresholds can be regarded as reference values, and further studies are required.

Murray RA. A critical look at soft-sided and hard-sided "mild" hyperbaric chambers - risks, regulations, and ethical oversights. Undersea Hyperb Med. 2026 Third Quarter;53(3):523-534. PMID: 42826431.

Soft-sided hyperbaric chambers, as well as some hard-sided (mild) hyperbaric chambers, which are low-pressure, hyperbaric chambers that are typically designed for operational pressures of 3-5psi, have gained popularity in recent years. They are marketed as safe and effective for various conditions but lack compliance with critical regulatory and safety standards and codes. This raises concerns regarding patient safety, the validity of manufacturers' claims, and the ethical obligations of medical professionals and regulators. This manuscript examines the risks, regulatory gaps, and ethical implications of using soft-sided fabric chambers, as well as hard-sided (mild) hyperbaric chambers, focusing on their failure to meet FDA clearance, NFPA 99 & NFPA 101 codes, and ASME-PVHO standards. A comprehensive review of regulatory guidelines, safety reports, and marketing practices was conducted, supplemented by illustrations of adverse events linked to the use of these devices. Ethical principles, including beneficence, non-maleficence, and informed consent, were applied to analyze the responsibilities of manufacturers, healthcare providers, patients, and regulators. These chambers are often marketed with misleading claims about their efficacy and safety. Their non-compliance with FDA clearance, as well as not following industry standards and safety codes increases the risk of patient harm, including otic and pulmonary barotrauma, suffocation, fire hazards, structural failure, and, in extreme cases, death. Regulatory oversight remains inconsistent, allowing manufacturers to exploit loopholes. Furthermore, ethical concerns arise when patients are not fully informed of the limitations and risks of these devices. The widespread use of these hyperbaric chambers poses significant safety and ethical challenges. Stricter enforcement of regulatory standards and codes, transparent marketing practices, and ethical accountability from healthcare providers and manufacturers are essential to protect patients and uphold public trust in medical technologies.

Pisano TJ, Zotter B, Lambert DS, Prasad S. Decompression Sickness Myelopathy: Case Report and Acute Management Review for the Neurologist. Neurohospitalist. 2026 Oct 16:19418744261500155. doi: 10.1177/19418744261500155. Epub ahead of print. PMID: 42892852; PMCID: PMC13675418.

Decompression sickness (DCS) is an uncommon but important cause of acute myelopathy that neurologists should recognize in the emergency setting. We report a 43-year-old experienced technical diver who developed acute sensory loss with a thoracic sensory level, gait dysfunction, upper motor neuron signs, and urinary retention after rapid ascent from approximately 90 feet below sea level. Thoracic spine MRI demonstrated longitudinal, posterior-predominant T2/STIR hyperintensity from T3 to T10-11 without pathologic enhancement, supporting spinal cord DCS. He received prompt hyperbaric oxygen therapy using U.S. Navy Treatment Table 6, along with 100% oxygen, horizontal positioning, and intravenous fluid resuscitation, followed by additional hyperbaric treatments for persistent sensory and autonomic symptoms. He improved rapidly, regained independent ambulation, and later returned to high-level physical activity, although intermittent sensory symptoms persisted during follow-up. This case illustrates the clinical presentation of spinal cord DCS and emphasizes the importance of early hyperbaric oxygen therapy alongside consensus-supported measures for oxygenation, intravascular volume repletion, thermal protection, and safe positioning. The independent effects of these supportive measures on neurologic recovery remain uncertain. Evidence for additional pharmacologic adjuncts, including NSAIDs and corticosteroids, is limited, and cerebrospinal fluid drainage remains unproven in DCS.

Pucko EB, Godlewski J, Kaźmierczak N, Ostrowski RP. Anti-Glioma Agents and Hyperbaric Oxygen for Prospective Therapeutic Approaches. Int J Mol Sci. 2026 Sep 23;27(19):8504. doi: 10.3390/ijms27198504. PMID: 42883754.

Adjuvant treatments for IDH-wild-type adult high-grade gliomas (HGGs) are being explored to improve therapeutic efficacy. Tumor hypoxia poses a major therapeutic challenge. In this narrative review, we discuss the potential of hyperbaric oxygen to counteract hypoxia and therapeutic resistance in HGG, with particular emphasis on glioblastoma. We delineate the pros and cons of combining treatment with hyperbaric oxygen (HBO) with established and experimental treatments for glioblastoma. HBO has been investigated as an adjuvant treatment alongside radiotherapy and chemotherapy, including new investigational compounds and approaches, with predominantly favorable outcomes in overall treatment efficacy. Among the numerous anticancer phytopharmaceuticals and nutraceuticals in this treatment paradigm, research on curcumin and its derivatives may lay the groundwork for promising future research directions and new chemical syntheses. The growing body of laboratory and clinical data suggests that HBO should be considered a promising component of modern oncological strategies for patients with HGG. However, further studies are needed to substantiate the effects of HBO since it has also been associated with increased tumor proliferation in some studies. Moreover, further studies are needed to substantiate the effects of HBO on tumor/immune interactions, stemness, therapy resistance, and patients' quality of life.

Sun Y, Yang Y, Wang Z, Zhao H, Ge X, Pan S. Optimizing hyperbaric oxygen therapy for sudden hearing loss. Otolaryngol Head Neck Surg. 2026 Oct 1. doi: 10.1002/ohn.70449. Epub ahead of print. PMID: 42820475.

Objective: To optimize the hyperbaric oxygen therapy protocol for sudden sensorineural hearing loss by identifying the most effective treatment course and analyzing key prognostic factors through a multicenter retrospective cohort study. Study design: Retrospective cohort study. Setting: The study conducted at 4 tertiary hospitals equipped with hyperbaric oxygen (HBO) facilities in Shanghai, China. Patient enrollment occurred between January 2022 and September 2024. Participants were identified from the clinical records of patients presenting with sudden sensorineural hearing loss (SSNHL) at the participating centers. Methods: This multicenter retrospective cohort study (n=1309) enrolled patients meeting 2019 AAO-HNS guidelines. The HBO group (n=991) received 2.2 ATA HBO combined with corticosteroids, while the non-HBO group (n=318) received corticosteroids alone. Primary and secondary outcomes were hearing recovery rates at treatment completion and 90-day follow-up, respectively. Results: 11 to 20 HBO sessions significantly increased rates of slight (OR=2.205, 95% CI: 1.399-3.474, P=0.001) and partial recovery (OR=2.236, 95% CI: 1.429-3.500, P<0.001) at treatment completion, but not complete recovery. At 90 days, 11 to 20 sessions significantly promoted complete recovery (OR=00.422, 95% CI: 0.224-0.793, P=0.007). Efficacy was significantly influenced by initial hearing loss degree; patients with total deafness showed lower partial recovery rates versus those with milder losses, while patients with very severe deafness showed the highest (125%). Age, delayed treatment, vertigo, and high initial pure-tone threshold were independent prognostic factors (P<0.05). No serious adverse events occurred. Conclusion: HBO combined with corticosteroids improves hearing recovery in SSNHL. Initiating 10 to 20 HBO sessions early, preferably within two weeks of onset, is recommended, especially for severe and total deafness. Future studies should standardize efficacy criteria to advance individualized treatment.

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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