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

E-NEWS

EDITOR'S NOTE – March 2025

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

Hyperbaric Chamber Accident in Michigan

While accidents are rare in hyperbaric chambers are rare, there are risks associated with pressurization and high oxygen content. A fire occurred in a hyperbaric chamber at the Oxford Center (https://theoxfordcenter.com) in Troy, MI on January 31, killing a five-year-old boy inside the monoplace unit and injuring his mother standing next to it. The treatment was reportedly offered to address issues of sleep apnea and attention deficit hyperactivity disorder, neither condition being an approved indication recognized by the Undersea and Hyperbaric Medical Society.
https://www.cbc.ca/news/canada/windsor/hyberbaric-chamber-explosion-1.7447815
https://www.fox17online.com/news/local-news/deadly-hyperbaric-chamber-explosion-brings-safety-concerns-after-5-year-olds-death
https://www.nbcnews.com/news/us-news/family-absolutely-devastated-son-killed-hyperbaric-chamber-rcna192263
https://drpeterwilmshurst.wordpress.com/2025/02/21/recent-death-confirms-regulators-are-failing-to-protect-patients

UPCOMING EVENTS

Boston Sea Rovers 2025

The 71st international ocean symposium and film festival with be held March 14-16 at the DoubleTree by Hilton-Boston North Shore in Danvers, MA. For more information: https://bostonsearovers.com.

AAUS Diving for Science Symposium 2025

The American Academy of Underwater Science Diving for Science symposium will be held March 24-29 in Seattle, WA. The event will be hosted by the University of Washington, the National Oceanic and Atmospheric Administration, and the Seattle Aquarium. Visit: https://aaus.org/annualsymposium.

Canadian Underwater Conference 2025

The Diver Certification Board of Canada (DCBC) will hold the 13th Canadian Underwater Conference & Exhibition March 30-April 01 at the Executive Hotel Vancouver Airport in Richmond, BC. For more information, visit: https://www.underwaterconference.ca.

UMC Introductory Diving Medicine Course

Undersea Medicine Canada is offering a Level 1 'Introductory Course in Diving Medicine - Fitness to Dive' May 12-16 at the Atlantic Commercial Diving Centre in Summerside, PEI. An optional half-day pre-course will be held on May 11 for those wanting additional preparation for the program. Visit: https://underseamedicine.ca or contact Dr. Debbie Pestell at drdeb1@ns.sympatico.ca or 902-225-8214 for more information.

DAN-UHMS Diving and Hyperbaric Medicine Special Topics Course

Divers Alert Network and the Undersea and Hyperbaric Medical Society will offer a deeper dive into select dive medicine and clinical hyperbaric medicine topics. The program is intended to add knowledge to an existing foundation of diving medicine. It will be held May 24-31 at Anse Chastanet on St. Lucia. Faculty include Jim Holm, Chris Logue, Simon Mitchell, and Neal Pollock. For more information: DAN@caradonna.com or 800-421-9999.

AsMA-UHMS Joint Scientific Meeting 2025

The joint scientific meeting of the Aerospace Medical Association and the Undersea and Hyperbaric Medical Society will be held June 01-06 at the Hyatt Regency Hotel in Atlanta, GA. For more information, visit: https://www.asma.org/scientific-meetings/asma-annual-scientific-meeting/2025-asma-uhms-annual-scientific-meeting.

EUBS Annual Scientific Meeting 2025

The annual scientific meeting of the European Underwater and Baromedical Society will be held September 02-06 in Helsinki, Finland. Information will be posted on the dedicated conference website: www.eubs2025.com.

RECENT PUBLICATIONS

Acevedo-Rodriguez C, Torre J, Barajas-Girón P, Hernández-Pimienta RE, Amador-Castro IG, Valdez D. Occupational health and safety concerns for hookah divers in small-scale fisheries in the Gulf of California, Mexico. J Agromedicine. 2025 Jan 8:1-10. doi: 10.1080/1059924X.2024.2449435. Online ahead of print.

Objectives: This study aimed to evaluate the working and health conditions faced by hookah divers in small-scale fisheries in the Midriff Islands Region of the Gulf of California, Mexico. Methods: The study was conducted in five fishing communities. A semi-structured questionnaire was administered to 113 fishers (~15% of the commercial divers in the region). Non-probabilistic snowball sampling was used to identify participants. Data were analyzed using descriptive statistics; a Chi-squared test was used to identify significant correlations. Results: Most respondents (98%) were men (average age of 41 years), with an average of 17.6 years of commercial diving experience. Only 27% of the divers were certified scuba divers, and 40% had received some type of dive training. Notably, 64% of divers had some chronic illness, and 75% had suffered some type of diving-related injury. Marine animal bites were the most common type of injury. The majority of respondents (97%) fished without the proper permits, and 67% did not have access to social insurance. Lastly, 50% had suffered symptoms of decompression sickness. Conclusion: The conditions surrounding the employment and health of hookah divers are extremely precarious in the Midriff Islands Region, as has been identified in other parts of the world. This study highlights the need to improve working conditions, implement appropriate training programs, and establish public policies that benefit the divers and the ecosystems upon which they depend.

Cha J, Bosco G, Moon RE, Melloni G, Camporesi EM. Hyperbaric oxygen therapy (HBOT) for management of complex regional pain syndrome (CRPS). Clin J Pain. 2025 Jan 29. doi: 10.1097/AJP.0000000000001276. Online ahead of print.

Objectives: Complex regional pain syndrome remains a challenging condition characterized by severe, persistent pain and a variety of inflammatory and trophic symptoms. This study aimed to analyze the current literature to evaluate hyperbaric oxygen therapy (HBOT)'s efficacy in treating complex regional pain syndrome (CRPS), focusing on both sympathetically-maintained pain (SMP) and sympathetically-independent pain (SIP) subtypes. Methods: A comprehensive literature search was conducted in PubMed Clinical Queries using the MeSH term "Complex Regional Pain Syndromes" OR the keyword "CRPS" AND "Hyperbaric Oxygen Therapy" OR the keyword "HBOT". The selected publication types included a randomized controlled trial, a retrospective observational study, a comparative study, a retrospective case series and case reports. The search was restricted to articles published in English between January 1994 and October 2024. The results from the search were used to compile this review. Patients were categorized into SMP, SIP, or indeterminate groups based on the presence of prior sympathetic nerve block history or disease duration. Results: Thirteen studies involving 280 subjects were reviewed. Of the patients, 42.5% were categorized as SMP, 48.2% as SIP, and 9.3% as indeterminate. HBOT treatment ranged from 3 to 63 sessions, typically using 2.4 ATA for 90 minutes. The results indicated significant symptom relief and functional improvement across both SMP and SIP subtypes, suggesting the broad efficacy of HBOT for CRPS management. Discussion: This review of the current literature suggests that HBOT may offer significant symptom relief, regardless of CRPS subtype or disease duration. HBOT's anti-inflammatory and neuroplasticity promoting properties make it a valuable non-invasive option for CRPS patients, potentially improving outcomes when combined with other therapeutic modalities. Further research is necessary to refine patient selection and optimize treatment protocols.

Karadurmus U, Bıçaklı R, Erdoğan G. Knowledge-level assessment of commercial divers: a focus on fundamental decompression procedures. Int J Occup Saf Ergon. 2025 Feb 11:1-8. doi: 10.1080/10803548.2025.2455865. Online ahead of print.

Commercial diving, a specialized profession encompassing various underwater tasks for industries such as construction and maintenance, exposes divers to unique hazards and challenges. Fundamental diving knowledge, encompassing the understanding of diving theories (DTs) and decompression procedures (DCPs), plays a pivotal role in enhancing diving safety. This study aims to assess the knowledge level of professional commercial divers regarding fundamental DTs and DCPs. The findings reveal notable disparities in knowledge levels among divers based on their qualifications, service sectors and professional experiences. While first-class divers, mixed-gas divers and second-class divers demonstrated satisfactory understanding of essential DTs and DCPs, individual divers and aquaculture divers exhibited potential knowledge gaps. The identified discrepancies underscore the significance of professional knowledge in ensuring diver safety and signal the need for targeted training programs to enhance divers' understanding of essential DTs and DCPs.

Lippmann JM. Snorkelling and breath-hold diving fatalities in Australia -a review of 317 deaths. Int J Environ Res Public Health. 2025 Jan 18;22(1):119. doi: 10.3390/ijerph22010119.

As snorkelling and breath-hold diving are conducted in a potentially hostile environment by participants with varying skills and health, fatalities occur. In this study, snorkelling and breath-hold diving fatalities were investigated in Australia from 2000 to 2021 to identify causes and countermeasures. The Australasian Diving Safety Foundation database and the National Coronial Information System were searched to identify snorkelling/breath-hold diving deaths from 2000 to 2021. Relevant data were extracted, recorded, and analysed. The median age of the 317 victims was 48 years, two-thirds were overweight or obese, and almost half had health conditions, including ischaemic heart disease (IHD) and left ventricular hypertrophy (LVH), predisposing them to an arrhythmia-related snorkelling incident. One-third of victims were likely disabled by cardiac arrhythmias and at least 137 deaths were from primary drowning, with 34 following apnoeic hypoxia. Pre-existing health conditions, particularly IHD and LVH, predispose to many snorkelling deaths in older participants and may be somewhat mitigated by targeted health screening. Drownings from apnoeic hypoxia persist in younger breath-hold divers who should avoid pushing their limits without close monitoring. Skills practice in a controlled environment, increased focus on the importance of an effective buddy, and improved supervision are necessary to mitigate risk in the inexperienced.

Mackay K, Thompson R, Parker M, Pedersen J, Kelly H, Loynd M, Giffen E, Baker A. The role of hyperbaric oxygen therapy in the treatment of diabetic foot ulcers - a literature review. J Diabetes Complications. 2025 Feb 13;39(3):108973. doi: 10.1016/j.jdiacomp.2025.108973.

Diabetic foot ulcers (DFUs) are chronic foot wounds, in a person with diabetes, which are associated with peripheral arterial insufficiency and/or peripheral neuropathy of the lower limb. Recent UK audit figures report that approximately 50-60% of DFUs remain unhealed after 12 weeks. Previous research has suggested that ischaemia plays a key role in the pathophysiology of many chronic wounds, including DFUs. For this reason, hyperbaric oxygen therapy (HOT) has been investigated. The study aimed to investigate 1) Current understanding of the physiology of normal wound healing and the pathological mechanisms that occur in DFUs to interrupt these processes; 2) Effectiveness of current DFU treatment approaches; 3) Effectiveness from clinical trials and meta-analyses for any demonstrated therapeutic benefits of HOT in the treatment of DFUs, 4) Patient selection criteria for HOT, and patients who stand to benefit most from treatment. The review found that wound healing is a complex process, involving many cells and signalling molecules, and it remains incompletely understood. However, current evidence suggests that hyperglycaemia, hypoxia, chronic inflammation (due to infection, immune-cell dysfunction or other causes), peripheral neuropathy, and macro- and micro-vascular dysfunction may all adversely affect DFU healing. The review found that current NICE guidelines do not approve HOT therapy in the UK for DFU's, despite encouraging clinical research findings. HOT shows theoretical promise and has been successfully used in the treatment of individual DFUs for several decades. Despite this, there remains a lack of strong clinical evidence of benefits to encourage HOT's wider use. The review found that there were four important patient selection criteria for HOT treatment, including glycaemic control, possible contraindications and complications associated with treatment, ulcer severity and resistance to first- and second-line treatments. The review concluded that further high-quality clinical research is needed to improve the evidence base.

Pernett F, Schagatay E, Holmström P. Sex-based variations in breath-holding: oxygen storage and diving response among non-divers. Front Physiol. 2025 Jan 13:15:1515232. doi: 10.3389/fphys.2024.1515232. eCollection 2024.

Breath-hold diving performances are typically better in men than in women. However, it is still being determined if there are differences in the physiological responses to breath-holding between the sexes. We conducted a study comparing the maximum breath-hold duration, heart rate (HR) reduction, peripheral oxygen saturation (S_pO_2), and spleen volume and contraction in 37 men and 44 women, all of whom had no prior breath-holding experience. They performed two dry apneas separated by 2 min; the first was limited to 60 s, followed by a maximal effort apnea. HR and S_pO_2 were measured continuously. Spleen diameters were measured via ultrasonography before and immediately following each apnea. The maximal apneic duration was longer in men (78±19 s) compared with women (61±18 s, $p<0.001$), while the HR reduction was similar (women: 16±19% versus men: 16±17%, $p=0.973$). The absolute splenic contraction was greater in men (59±56 mL) compared with women (35±28 mL, $p<0.001$) in the first apnea, while the relative contraction was similar (women: 21±17% versus men: 23±13%, $p=0.528$). In addition, the lowest SpO2 during the maximal apnea was similar between sexes (women: 93.3±4.4%; men: 91.9±4.3%, $p=0.161$). We conclude that men have larger spleen size and contraction, lung size, and maximal apneic duration than women. The cardiovascular diving response is similar between sexes for those inexperienced with apneic diving. The longer breath-hold duration in men may be partly due to greater oxygen storage capacity, which results from larger vital capacity and greater spleen size and contraction.

Sanders JV, Oliver MJ, Lopes DK. Air emboli during neuroendovascular procedure treated with hyperbaric oxygen therapy. BMJ Case Rep. 2025 Feb 3; 18(2): e263969. doi: 10.1136/bcr-2024-263969.

Air embolism is a rare complication of endovascular procedures with hyperbaric oxygen therapy (HBOT) as a potential treatment. We report a male patient in his 40s presented to the emergency department with the following fluctuating symptoms: headache, aphasia, bilateral arm and hand weakness, numbness and blurry vision. Medical history included remote vertebral artery dissection, hypertension and tobacco use. Initial head CT was normal; CT angiogram revealed bilateral internal carotid artery dissections with significant stenosis. He was taken for emergent carotid intervention. During the intervention, the patient developed agitation, bradycardia and respiratory distress, necessitating intubation. Dyna CT revealed air emboli. HBOT was initiated, leading to complete resolution of air emboli and small haemorrhages after one session. Post-treatment, the patient showed neurological improvement, was extubated and later discharged with mild residual aphasia and dysarthria. This case underscores air emboli as a rare complication in the neurointerventional suite and highlights HBOT as a feasible treatment.

Scheinkman R, Gwillim E, Barbota K, Tordjman L, Houk G, Latta S, Jean-Pierre P, Nouri K. The dermatology of recreational scuba diving: a narrative review. Int J Dermatol. 2025 Feb 11. doi: 10.1111/ijd.17677. Online ahead of print.

Scuba diving is a popular watersport in the United States, with over 9 million certified divers. This activity uses specialized equipment that enables swimmers to explore deeper into the ocean for a more extended period than free diving. This popularity has led to the development of diving medicine, a multidisciplinary field that includes dermatologic management. An extensive literature review was conducted on PubMed and Google Scholar, using key search terms related to diving and dermatology to compile relevant peer-reviewed articles. This review examines the dermatological impacts of recreational and commercial diving. We explore hyperbaric oxygen therapy, its effects on the skin, and its potential benefits in wound healing. Furthermore, we present how environmental factors such as ultraviolet (UV) exposure and marine water toxins may increase skin cancer risk. We also discuss the risk of direct injury and envenomation from marine organisms and the risk of bacterial wound infections from different pathogens in marine water. We also reviewed the cutaneous manifestations of decompression sickness. As more people engage in recreational and commercial diving for extended periods, further research on potential dermatological implications is needed. Dermatologists could provide counseling on the use of sun-protective clothing and sunscreen to minimize cancer risk from UV exposure, on self-cleaning wounds to minimize infection risk from marine pathogens and identifying cutaneous infections, signs of decompression sickness, and methods of treating and preventing marine envenomation and bites.

Weaver LK, Ziemnik R, Deru K, Russo AA. A double-blind randomized trial of hyperbaric oxygen for persistent symptoms after brain injury. Sci Rep. 2025 Feb 26;15(1):6885. doi: 10.1038/s41598-025-86631-6.

In this double-blind randomized trial, adults with persistent symptoms following non-stroke brain injury received 40 hyperbaric oxygen (HBO_2) sessions or 40 sham sessions over 12 weeks. Three months later, all were offered 40 unblinded HBO_2 sessions. Participants completed the Neurobehavioral Symptom Inventory (NSI) at baseline, 13 weeks (after 40 chamber sessions), 6 months, 9 months (after the second chamber series), and 12 months, with prime outcome at 13 weeks, and additional questionnaires, neuropsychological tests, and functional measures. We enrolled 49 participants and analyzed 47 due to drop-out/exclusion (26 males, 40 with traumatic brain injury). Baseline NSI was 35.9±15.8 in the HBO2 group (n=26) and 30.7±16.9 in the sham group (n=21) (p=0.28). Mean 13-week change scores were 10.6±10.6 (HBO_2 group) and 3.6±5.9 (sham group) (mean difference 7.0, 95% CI 1.7-12.3, p = 0.01). The HBO_2 group improved on measures of olfaction, anxiety, sleep difficulties, and vestibular complaints. Both groups reported improvements in depression, headaches, PTSD symptoms, physical quality of life, and degree to which difficulties interfere with daily life. With an additional 40 HBO_2 sessions, the original HBO_2 group reported additional improvements on NSI at 12 months. Only 15 original sham participants completed the second chamber series, limiting conclusions from that data.

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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