

E-NEWS

EDITORIAL NOTE – June 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

UMC Introductory Diving Medicine Course Wrap

Undersea Medicine Canada delivered a 40-h Level 1 'Introductory Course in Diving Medicine - Fitness to Dive' course May 11-15 in Halifax, NS (with optional half-day pre-course on May 10). Activities included tours of the Atlantic Fleet Diving Unit and Dominion Diving. Six provinces were represented by the 16 student participants. Physicians who successfully complete the program are qualified 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. The course provided 35 MAINPRO+ CME credits from the College of Family Physicians of Canada. Information on future courses (Level 1 and 2) will be posted on the UMC website (<https://underseamedicine.ca>).



May 2026 UMC Level 1 course participants and faculty



Portable and fixed hyperbaric chambers at Fleet Diving Unit Atlantic, Shearwater, NS

CUHMA Virtual Scientific Meeting 2026 Wrap

The 2026 CUHMA virtual scientific meeting was held on May 02. The seven-hour program addressed both hyperbaric and diving topics, sparking good discussion following individual presentations and in the open forum period. The invited faculty presentations were recorded and will be available to members through the CUHMA website.

♦ Invited faculty (left to right below)

- Peter Lindholm, MD, PhD (Sweden)
- Jeffrey McCurdy, MD, PhD (Canada)
- Nicholas Bird, MD (US)
- Jocelyn (Josh) Boisvert, CHT (Canada)
- Neal Pollock, PhD (Canada)
- Simon Mitchell, MD, PhD (New Zealand)
- Chris Logue, MD (US)

♦ Original research

- Léa Perron
- Rose Plourde
- Talia Khazei
- Emma Fontaine
- Kaghley Brett, MD



UPCOMING EVENTS

Canadian Association of Wilderness Medicine 2026

CAWM is a non-profit organization with the goal of connecting Canadian practitioners and researchers with an interest in wilderness medicine, and in promoting the field as an area of focus and specialization. The seventh annual conference will be held September 11-13 in Whistler, BC and virtually in a hybrid format. Pre-conference workshops will also be offered. Visit: <https://cawm.ca/cawm2026>.

Divescapes Scuba Conference 2026

The Divescapes scuba conference and exhibition will be held October 16-17 at the Evario Events Centre in Edmonton, AB. The Alberta Underwater Council program includes international speakers, workshops, and trade show booths. Visit: <https://www.divescapes.ca>.

RECENT PUBLICATIONS

Carter MJ, Eckert KA, Fife CE, Gelly HB. Systematic review of comparative studies evaluating hyperbaric oxygen therapy on skin flap and graft surgical indications. *Plast Reconstr Surg Glob Open.* 2026 May 26;14(5):e7750. doi: 10.1097/GOX.0000000000007750. eCollection 2026 May.

Background: This systematic review aims to determine whether pre- and postoperative hyperbaric oxygen therapy (HBOT) incurs any benefits or harms in soft tissue injuries (STIs) considered for skin flap or graft surgery. **Methods:** We included adequately powered clinical trials that enrolled patients with STIs serious enough for skin flaps or grafts; evaluated HBOT (≥ 1.5 ATA) versus control, placebo, or sham procedures; and analyzed survival/healing and complication rates. MEDLINE, Google Scholar, and Embase were searched for relevant literature through June 30, 2024. The Cochrane risk of bias (RoB 2) and the ROBINS-I tools assessed RoB. Meta-analysis and random effects models analyzed randomized controlled trial (RCTs) evaluating flap/graft survival rates within 4 weeks of HBOT (2-2.5 ATA). The GRADE approach determined the evidence recommendations. **Results:** Among 743 records screened, 45 were assessed; 25 reports from 24 studies (13 RCTs; 11 non-RCTs; 2246 patients) were included. RCT RoB ranged from low RoB (1 trial) to high (2 trials). Nonrandomized trials had moderate RoB ($n=5$, 45%), whereas 6 had serious RoB. Four RCTs showed a large, horizontal overall effect size (log odds ratio, 1.045; standard error, 0.3104; z , 3.3.67; $P<0.001$; 95% confidence interval, 0.44-1.65). Evidence levels were very low to moderate, with 11 strong and 13 conditional recommendations, including a strong recommendation to use HBOT to heal flaps/grafts in STI/trauma wounds. **Conclusions:** A strong

recommendation for pre- and postoperative HBOT is warranted to mitigate the need for flap/graft surgery and heal flaps and grafts, given the potentially life- and/or limb-threatening harms that could otherwise occur.

Gur I, Safrai A, Nov Y. The effects of hyperbaric oxygen dosing on the delayed neuropsychiatric sequelae of carbon monoxide poisoning. *Clin Toxicol (Phila).* 2026 May 18:1-9. doi: 10.1080/15563650.2026.2666318.

Introduction: A paucity of evidence exists as to the comparative effectiveness of various hyperbaric oxygen regimens in preventing delayed neuropsychiatric sequelae. We aimed to compare the effect of four such treatment regimens: (1) PO₂ = 2.0 ATA for 90 min once; (2) PO₂ = 2.0 ATA for 90 min thrice; (3) PO₂ = 2.8 ATA for 90 min once; and (4) PO₂ = 2.8 ATA for 90 min once followed by two sessions of 2.0 ATA. **Methods:** We retrospectively reviewed the records of all patients treated in a large regional hyperbaric referral facility over the past 30 years, and identified patients displaying any new cognitive, motor or psychiatric symptoms within 2-40 days from exposure to carbon monoxide - any of which was defined as delayed neuropsychiatric sequelae. Excluded were patients not complying with the full prescribed treatment course or those lacking a full medical record for at least a year following exposure. **Results:** Of 312 patients included in the final analysis, the incidence of delayed neuropsychiatric sequelae was 31/87 (36%), 20/54 (37%), 20/102 (20%) and 13/69 (19%) in the 2.0 ATA once, 2.0 ATA thrice, 2.8 ATA once and 2.8 ATA thrice treatment groups, respectively ($P=0.011$). Patients treated with the lower-pressure regimen (2.0 ATA once and thrice) had a significantly higher delayed neuropsychiatric sequelae rate compared to those treated with higher PO₂ (2.8 ATA once and thrice) - 36% versus 19% respectively ($P=0.0013$). In a multivariate logistic regression model adjusting for age, carboxyhemoglobin levels, and presenting symptoms, the higher-pressure protocol was independently associated with a 55% reduction in the odds of developing delayed neuropsychiatric sequelae (adjusted odds ratio = 0.45; 95% confidence interval: 0.26-0.77; $P=0.004$). Increasing the frequency of sessions from one to three was not associated with a statistically significant benefit ($P=0.9$). The presence of seizures on admission was the strongest predictor of poor outcome (adjusted odds ratio=4.27; $P=0.023$). **Discussion:** The observed 55% reduction in the odds of developing delayed neuropsychiatric sequelae with the 2.8 ATA protocol suggests that achieving a higher initial partial pressure of oxygen is critical to effectively interrupting the inflammatory cascades associated with carbon monoxide toxicity. Because additional sessions did not confer a statistically significant benefit, meeting this initial therapeutic threshold appears more impactful than treatment frequency. Notably, the neuroprotective benefits of the higher-pressure regimen were sustained even among high-risk patients presenting with seizures. **Conclusions:** A

PO₂ of 2.8 ATA rather than 2.0 ATA in the initial hyperbaric oxygen session, is associated with superior neuroprotective outcomes, while the overall number of sessions is not.

[Editorial note: Oxygen partial pressure (PO₂) should be expressed in atm (atmospheres), not ATA (atmospheres absolute). The confusion arises when 100% oxygen is breathed and the two are quantitatively equivalent.]

Knezevic D, Zivkovic V, Jakovljevic V, Mirkovic N, Ilic M, Andjelkovic M, Mijajlovic J, Fisenko V, Balovic G, Kolak D. Association of hyperbaric oxygen therapy with platelet reactivity in patients with advanced peripheral arterial disease: a prospective observational study. J Clin Med. 2026 May 12;15(10):3723. doi: 10.3390/jcm15103723. PMID: 42194683.

Objective: Peripheral arterial occlusive disease (PAOD) is characterized by impaired tissue perfusion, chronic ischemia, and increased platelet reactivity. Hyperbaric oxygen therapy (HBOT) is used as adjunctive treatment in advanced PAOD, but its effect on platelet function remains insufficiently studied. This study examined the association between HBOT and platelet aggregation. Methods: This prospective observational study included 90 patients with Fontaine stage IV PAOD and chronic ulceration, assigned to an HBOT group (n=60) or waiting-list control group (n=30). Patients were predominantly male; mean age was 66.82±9.42 years in the study group and 63.00±8.31 years in controls, and diabetes mellitus was present in 55.0% and 63.3%, respectively. Prior revascularization included open surgery in 33.3% and 30.0%, endovascular treatment in 36.7% and 43.3%, and no option for revascularization in 30.0% and 26.7%, respectively. HBOT was administered over 4 weeks (20 sessions, 2.0-2.5 ATA). Platelet aggregation was measured by impedance aggregometry using arachidonic-acid-induced aggregation (ASPI), adenosine-diphosphate-induced aggregation (ADP), and thrombin-receptor-activating peptide-induced aggregation (TRAP) agonists. Changes were analyzed using generalized estimating equation models adjusted for antiplatelet therapy, diabetes mellitus, smoking, and C-reactive protein (CRP). Results: Significant group × time interactions were observed for all platelet activation pathways, indicating greater reductions in the HBOT group than controls: ASPI (β=-290.5; p<0.001), ADP (β=-243.6; p<0.001), and TRAP (β=-330.9; p<0.001). No significant change was observed in controls. HBOT was associated with reduced pain intensity, while CRP and platelet-to-lymphocyte ratio (PLR) remained stable. Ulcer size showed no significant change after 4 weeks. Conclusions: In patients with PAOD, HBOT was associated with reduced platelet reactivity independent of antiplatelet therapy. Further randomized studies are needed to determine its clinical significance.

Mulders L, Pruijt M, Van Oostrom J, Van Der Zanden E, Neeffjes-Borst A, Koelink P, Wildenberg M, De Jonge W, Ridderikhof M, Van Hulst R, D'Haens G, Geese K. Hyperbaric oxygen therapy alters bowel perfusion and improves outcomes in patients with treatment-refractory ulcerative colitis: a prospective pilot trial. J Crohns Colitis. 2026 May 8;20(5):jjag065. doi: 10.1093/ecco-jcc/jjag065. PMID: 42136082; PMCID: PMC13175981.

Background: Hyperbaric oxygen therapy (HBOT) delivers 100% oxygen in a pressurized chamber and enhances tissue oxygenation and neovascularization. While effective in radiation proctitis, acute severe ulcerative colitis, and perianal fistulizing Crohn's disease, its role in refractory ulcerative colitis (UC) remains underexplored. Methods: PARADOX was a prospective, open-label, phase 2a pilot trial in biologic-experienced patients with moderate-to-severe refractory UC (total Mayo >5, Mayo endoscopic subscore (MES) ≥2, failure of ≥2 advanced therapies). Patients received 10 or 20 daily HBOT sessions (2.4 atmospheres absolute, 120 minutes/day) while continuing stable background therapy. The primary endpoint was composite clinical and endoscopic response at week 12 (≥3-point and 30% Mayo score reduction, rectal bleeding score=0, and ≥1-point decrease in MES). Secondary outcomes included symptomatic, biochemical, and transmural response by intestinal ultrasound (IUS), including perfusion metrics via contrast-enhanced ultrasound (CEUS). Results: In total, 16 patients (8 per group) were included in this pilot study. At week 12, composite response was achieved in 2/8 (10-session) and 4/8 (20-session) patients. Improvements in clinical, endoscopic, and IUS parameters were observed in both groups. Clinical responders showed increased CEUS perfusion at week 12 (peak enhancement Δ12.1 dB), while non-responders declined (Δ -5.4 dB). This pattern was consistent across wash-in/wash-out metrics, supporting a volume perfusion-based response. HBOT was well tolerated, with no serious adverse events or treatment discontinuations. Conclusion: HBOT is a well-tolerated adjunctive therapy in refractory UC, which improved clinical outcomes and perfusion kinetics. These findings support further evaluation in a randomized, dose-optimized trial. [Euclinicaltrials.eu](https://www.euclinicaltrials.eu), EU CT #2024-515278-28-00.

Nishikiori H, Ishitake T. Short-term effects of video-based education on occupational safety knowledge among commercial divers. Front Public Health. 2026 Apr 15;14:1799866. doi: 10.3389/fpubh.2026.1799866.

Background and objectives: Video-based learning has improved educational outcomes in medicine and nursing. However, in the field of commercial diving, despite the broad range of knowledge required, the effectiveness of license renewal and continuing education systems has not been sufficiently examined. This study evaluated the short-term effects of a video-based educational intervention on OSH knowledge and learning motivation among

commercial divers and examined its usefulness as a CE tool. Methods: A web-based quasi-experimental single-group pre-post intervention study was conducted between November 2024 and August 2025 with the cooperation of the Japan Dive Association. The target population comprised approximately 3,000 commercial divers from 160 corporate member companies. The intervention included a baseline questionnaire, a 13-item OSH knowledge test, an educational video, a post-test, and a final questionnaire. Eighty-one valid responses were analyzed using a paired t-test, with significance set at $p < 0.05$. Results: The mean correct response rate increased significantly from 46.6 to 66.3% after the intervention ($p < 0.05$). The mean number of correct answers increased from 6.1 to 8.6 ($p < 0.0001$). Knowledge improved for decompression sickness, high-altitude diving, and arterial gas embolism, whereas improvement was limited for M-values in decompression theory and pulmonary oxygen toxicity. Participants also reported increased motivation for information seeking and digital learning. Conclusion: Education using short answer-explanation videos improved short-term knowledge of the key topics examined and enhanced learning motivation among commercial divers. This approach may support the development of continuing education (CE) programs.

Peng B, Chen GZ, Ji XW, Li X, Jiang ZL. Pathophysiological mechanisms of high-pressure nervous syndrome: a comprehensive review. Neuroscience. 2026 May 6:S0306-4522(26)00310-6. doi: 10.1016/j.neuroscience.2026.05.007.

High-pressure nervous syndrome (HPNS) refers to a series of neurological disturbances that occur during exposure to high hydrostatic pressure, characterized by cognitive and motor impairment manifestations. This review systematically summarizes the research progress on the pathophysiological mechanisms of HPNS. The main mechanism is the imbalance between inhibition of synaptic transmission and the increased excitability of neural networks, specifically involving voltage-gated sodium, potassium, calcium channels, and N-methyl-D-aspartate (NMDA) receptors. Most HPNS symptoms subside upon returning to normal pressure, making the study of its mechanisms challenging. HPNS remains a significant limiting factor for deep-sea diving, and to date, no effective drugs have been developed for human HPNS prevention. This review focuses on the pathophysiological mechanisms of HPNS, which is crucial for further understanding its mechanisms and extending the limits of human deep-sea diving.

Prevautel T, Demoulin R, Schmitt P, Rohel G, Capilla E, Pons F, Adet A, Cellarier GR. Implementation of a patent foramen ovale closure program in a role 4 military hospital: initial experience and proof-of-concept for enhancing cryptogenic stroke care and military

diving operational readiness. Mil Med. 2026 May 6:usag218. doi: 10.1093/milmed/usag218.

Introduction: The Sainte-Anne Military Teaching Hospital in Toulon serves a dual mission as a civilian Stroke Center and a reference center for military diving medicine. This article presents an initial experience and proof-of-concept regarding the implementation of an on-site percutaneous patent foramen ovale (PFO) closure program, critical for secondary stroke prevention and the management of decompression sickness (DCS). Materials and methods: Implementing this activity required meeting national regulatory volume thresholds and developing specific protocols. Key challenges included establishing "remote anesthesia" in the catheterization laboratory and coordinating a multidisciplinary pathway. To ensure patient safety and rapid skill acquisition, structural cardiology protocols adhered strictly to international proctoring guidelines. Results: A comprehensive care pathway was successfully established. In its first year, the program performed 17 PFO closures (13 cryptogenic strokes, 3 DCS, 1 platypnea-orthodeoxia), achieving a 100% immediate anatomical success rate with zero complications. Early follow-up data ($n=5$ at 6 months) demonstrate a 100% complete sealing rate. For divers, a specific "Return to Duty" algorithm was formalized, strictly conditioning operational clearance upon a 6-month "Safety Visa" (contrast echocardiography and stress test), allowing for a zero-medication return to work. Conclusions: The internalization of PFO closure at a Role 4 military hospital validates a comprehensive "Dual-Use" care model. It ensures operational readiness for elite units by securing the pathway from diagnosis to anatomical repair, while utilizing high-volume civilian stroke care to maintain expert-level technical proficiency.

Rainwater TR, Georgitis WS, Sideleau BM, Platt SG. Remarkable survival by a scuba diver from an American Alligator attack. Wilderness Environ Med. 2026;37(2):259-267. doi: 10.1177/10806032251388579. Epub 2025 Oct 29. PMID: 41160528.

The American alligator (*Alligator mississippiensis*) is a large (total length to 4.5 m [14.7 ft]) crocodilian common (estimated 3-4 million) in the southeastern United States. Attacks by alligators on humans are infrequent but increasing. We provide a case report of a scuba diver attacked by an adult alligator, describe the outcome, and discuss the injuries sustained by the diver. This attack occurred in the Cooper River of coastal South Carolina. The diver was seized by the right arm moments after surfacing and, in turn, hugged the alligator to avoid further trauma in the event of a death roll. The alligator carried the diver to the riverbed (estimated depth 15 m). The victim gouged the eyes and jaws of the alligator with a screwdriver, effecting his release, and then surfaced slowly to avoid pulmonary barotrauma. Subsequent medical examination indicated that the diver suffered a Monteggia

fracture of the right ulna, characterized by an anterior dislocation of the radiocapitellar joint, and an oblique fracture of the proximal ulna. The Monteggia fracture was repaired by open reduction and internal fixation, with plate and screw fixation of the proximal ulna, postoperative alignment of the radiocapitellar joint, and staple fixation of the traumatic forearm. We estimated the total length of the alligator to be between 3 and 4 m and attribute the diver's survival to a number of factors-most notably the diver was equipped with scuba gear that allowed continued breathing when he was pulled beneath the water's surface by the alligator.

Šrámek M, Honěk J, Tomek A, Šefc L, Jarkovský J, Kyseřová A. Long-term survival of divers cohort compared to the general population in the Czech Republic. BMC Public Health. 2026 May 27. doi: 10.1186/s12889-026-27848-6. Online ahead of print.

Background: Diving involves unique physiological stressors and environmental exposures that may affect health outcomes. Long-term survival among divers results from a complex interaction between potentially harmful exposures related to the hyperbaric environment and oxidative stress, diving-related accidents, as well as protective factors such as physical fitness, psychological resilience, and socioeconomic status. The aim of this study was to evaluate long-term survival in a cohort of Czech divers compared with the general population. Methods: Data from 1,076 divers registered in the DIVE-PFO Registry (2005-2024) were linked with the National Health Information System to determine mortality and causes of death. Observed survival was estimated using the Kaplan-Meier method; expected survival was based on national life tables to calculate relative survival via the Pohar-Perme method. Results: Over 10,294 person-years of follow-up, there were 15 deaths (1.4%) among divers, of which four were classified as possible diving-related. No cardiovascular deaths were recorded. The annual diving-related mortality rate was 38.9 per 100,000 divers. Compared with the general population, our cohort of divers had significantly higher 10-year relative survival (101.9%, 95% CI 101.2-103.0). Divers also showed a lower prevalence of obesity, hypertension, and smoking compared to the general population. Conclusions: The DIVE-PFO diver cohort demonstrated better long-term survival than the general population.

Van Rees Vellinga TP, Hulshof CT, Van Ooij PJAM, Daams JG, Van Dijk FJH, Van Hulst RA. Occupational health surveillance of compressed air workers: a scoping review. Occup Med (Lond). 2026 May 23. doi: 10.1093/occmed/kqag011. Epub ahead of print. PMID: 42175559.

Background: Compressed air is increasingly used in the underground construction of caissons and tunnels. New risks have been identified, suggesting the need to develop

counter-measures. Aims: This scoping review aimed to provide insight into the health risks, prevention and surveillance measures, and adverse health effects related to compressed air work during tunnel construction. Methods: Health risks were assessed based on the Joanna Briggs Institute Reviewers' Manual, the recommendations of Pollock and the PRISMA Scoping Reviews Checklist. The scoping review mapped and analysed studies of compressed air work over the past 50 years. Only 45 studies were deemed eligible for inclusion in this review. Results: In the early days of mechanized tunnel construction, the incidence of decompression sickness was high, affecting up to 2032 individuals, with an incidence rate of the bends as high as 0.5%. Improvements in decompression tables and the use of mixed gases have reduced these rates to below 0.1%. New construction techniques have introduced new health risks, including silicosis. Because of traffic demands, especially in urban areas, newer tunnels have been built for operation at greater depths (up to 106 metres sea water). Conclusions: Relatively few studies in the past 50 years have analysed the effects of compressed air use for tunnel construction. Adverse health effects have decreased substantially over time, but several new health risks have been described. The registration of key information on health and safety risks and adverse health effects, in a highly accessible international repository is recommended.

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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