

E-NEWS

EDITOR'S NOTE – January 2024

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.

Best of the New Year to all!

Neal W. Pollock, PhD
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NEWS/ANNOUNCEMENTS

Arctic Focus

The increased open water in the Arctic is creating new opportunities and demands for access and attention. The captivating story of the search for the Northwest Passage can be found in an award-winning book by Canadian historian Ken McGoogan (2002):

Fatal Passage: The Story of John Rae, the Arctic Adventurer Who Discovered the Fate of Franklin

https://en.wikipedia.org/wiki/Fatal_Passage

Those interested in current stories of Arctic-based initiatives, spanning conservation, culture, discovery, innovation, and science may wish to check out Arctic Focus, a platform developed by the Antarctic Research Foundation, a Canadian non-profit organization founded in 2011 to aid in the search for the Franklin expedition vessels HMS *Terror* and HMS *Erebus*, and subsequently expanding the scope of engagement in the Arctic. For more information, visit:

<https://www.arcticfocus.org>

https://en.wikipedia.org/wiki/Antarctic_Research_Foundation

UPCOMING EVENTS

Boston Sea Rovers International Ocean Symposium

The 70th international ocean symposium and film festival will be held March 15-17 in Danvers, MA. For more information: <https://bostonsearovers.com/clinic-home>.

Canadian Underwater Conference 2024

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

AAUS Diving for Science Symposium 2024

The 2024 AAUS Diving for Science symposium will be hosted by the Smithsonian Marine Station at Fort Pierce with major contributions by Harbor Branch Oceanographic Institute, April 14-24 in Fort Pierce, FL. Visit: <https://aaus.org/annualsymposium>.

Ponza Rebreather Conference

The eighth iteration of the Ponza Rebreather Conference will be held May 8-12, 2024 on the island of Ponza, Italy (south of Rome and west of Naples in the Tyrrhenian Sea). Each day will include lectures and boat dives organized by the Ponza Diving Center. Space is limited. Visit: www.ponzadiving.com or info@ponzadiving.com.

UMC Level 2 Advanced Diving Medicine Course

Undersea Medicine Canada is offering a CSA Z275 Level 2 'Advanced Course in Diving Medicine: Diagnosis and Treatment.' This 6-day course will be held May 20-25, 2024 at the Atlantic Commercial Diving Centre in Summerside, PEI. Augmenting classroom instruction and case-based learning, site visits will allow observation of commercial diver training, diving, and hyperbaric chamber operations. A CSA Z275.2-15 Level 1 course or equivalent training is a prerequisite for this 45-h program. Find more information at <https://underseamedicine.ca> or contact Dr. Debbie Pestell at drdebl@ns.sympatico.ca or 902-225-8214.

UHMS Annual Scientific Meeting 2024

The annual scientific meeting of the Undersea and Hyperbaric Medical Association will be held June 12-15, 2024 in French Quarter of New Orleans. Visit: <https://www.uhms.org/education/annual-scientific-meeting/asm-registration.html#read-bio>.

EUBS Annual Scientific Meeting 2024

The 48th annual scientific meeting of the European Underwater and Baromedical Society will be held September 16-20 in the port city of Brest, France. Visit: <https://eubs2024.sciencesconf.org>

RECENT PUBLICATIONS

Banham N, da Silva E, Lippmann J. Cerebral arterial gas embolism (CAGE) during open water scuba certification training whilst practising a controlled emergency swimming ascent. *Diving Hyperb Med.* 2023 Dec 20;53(4): 345-50. doi: 10.28920/dhm53.4.345-350.

We report the case of a 23-year-old male novice diver who sustained cerebral arterial gas embolism (CAGE) during his open water certification training whilst practising a free ascent as part of the course. He developed immediate but transient neurological symptoms that had resolved on arrival to hospital. Radiological imaging of his chest showed small bilateral pneumothoraces, pneumopericardium and pneumomediastinum. In view of this he was treated with high flow normobaric oxygen rather than recompression, because of the risk of development of tension pneumothorax upon chamber decompression. There was no relapse of his neurological symptoms with this regimen. The utility and safety of free ascent training for recreational divers is discussed, as is whether a pneumothorax should be vented prior to recompression, as well as return to diving following pulmonary barotrauma.

Chmelař D, Rozložník M, Hájek M, Pospíšilová N, Kuzma J. Effect of hyperbaric oxygen on the growth and susceptibility of facultatively anaerobic bacteria and bacteria with oxidative metabolism to selected antibiotics. *Folia Microbiol (Praha).* 2023 Dec 15. doi: 10.1007/s12223-023-01120-5. Online ahead of print.

Wild strains of *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis* were tested in an experimental hyperbaric chamber to determine the possible effect of hyperbaric oxygen on the susceptibility of these strains to the antibiotics ampicillin, ampicillin + sulbactam, cefazolin, cefuroxime, cefoxitin, gentamicin, sulfamethoxazole + trimethoprim, colistin, oxolinic acid, ofloxacin, tetracycline, and aztreonam during their cultivation at 23°C and 36.5°C. Ninety-six-well inoculated microplates with tested antibiotics in Mueller-Hinton broth were cultured under standard incubator conditions (normobaric normoxia) for 24 h or in an experimental hyperbaric chamber (HAUX, Germany) for 24 h at 2.8 ATA of 100% oxygen (hyperbaric hyperoxia). The hyperbaric chamber was pressurised with pure oxygen (100%). Both cultures (normoxic and hyperoxic) were carried out at 23°C and 36.5°C to study the possible effect of the cultivation temperature. No significant differences were observed between 23 and 36.5°C cultivation with or

without the 2-h lag phase in *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis*. Cultivation in a hyperbaric chamber at 23°C and 36.5°C with or without a 2-h lag phase did not produce significant changes in the minimum inhibitory concentration (MIC) of *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis*. For the tested strains of *Pseudomonas aeruginosa*, the possible effect of hyperbaric oxygen on their antibiotic sensitivity could not be detected because the growth of these bacteria was completely inhibited by 100% hyperbaric oxygen at 2.8 ATA under all hyperbaric conditions tested at 23°C and 36.5°C. Subsequent tests with wild strains of pseudomonads, burkholderias, and stenotrophomonads not only confirmed the fact that these bacteria stop growing under hyperbaric conditions at a pressure of 2.8 ATA of 100% oxygen but also indicated that inhibition of growth of these bacteria under hyperbaric conditions is reversible.

Doolette DJ, Murphy FG. Within-diver variability in venous gas emboli (VGE) following repeated dives. *Diving Hyperb Med.* 2023 Dec 20;53(4):333-339. doi: 10.28920/dhm53.4.333-339.

Introduction: Venous gas emboli (VGE) are widely used as a surrogate endpoint instead of decompression sickness (DCS) in studies of decompression procedures. Peak post-dive VGE grades vary widely following repeated identical dives but little is known about how much of the variability in VGE grades is proportioned between-diver and within-diver. Methods: A retrospective analysis of 834 man-dives on six dive profiles with post-dive VGE measurements was conducted under controlled laboratory conditions. Among these data, 151 divers did repeated dives on the same profile on two to nine occasions separated by at least one week (total of 693 man-dives). Data were analysed for between- and within-diver variability in peak post-dive VGE grades using mixed-effect models with diver as the random variable and associated intraclass correlation coefficients. Results: Most divers produced a wide range of VGE grades after repeated dives on the same profile. The intraclass correlation coefficient (repeatability) was 0.33 indicating that 33% of the variability in VGE grades is between-diver variability; correspondingly, 67% of variability in VGE grades is within-diver variability. DCS cases were associated with an individual diver's highest VGE grades and not with their lower VGE grades. Conclusions: These data demonstrate large within-diver variability in VGE grades following repeated dives on the same dive profile and suggest there is substantial within-diver variability in susceptibility to DCS. Post-dive VGE grades are not useful for evaluating decompression practice for individual divers.

Druelle A, Daubresse L, Mullot JU, Streit H, Louge P. Hypoxic loss of consciousness in air diving: two cases of mixtures made hypoxic by oxidation of the scuba diving cylinder. *Diving Hyperb Med.* 2023 Dec 20;53(4):356-9. doi: 10.28920/dhm53.4.356-359.

Without an adequate supply of oxygen from the scuba apparatus, humans would not be able to dive. The air normally contained in a scuba tank is dry and free of toxic gases. The presence of liquid in the tank can cause corrosion and change the composition of the gas mixture. Various chemical reactions consume oxygen, making the mixture hypoxic. We report two cases of internal corrosion of a scuba cylinder rendering the respired gas profoundly hypoxic and causing immediate hypoxic loss of consciousness in divers.

Grundemann J, Vrijdag XC, Wong NY, Gant N, Mitchell SJ, van Waart H. Full-face snorkel masks increase the incidence of hypoxaemia and hypercapnia during simulated snorkelling compared to conventional snorkels. *Diving Hyperb Med.* 2023 Dec 20;53(4):313-20. doi: 10.28920/dhm53.4.313-320.

Introduction: Air flow in full-face snorkel masks (FFSMs) should be unidirectional to prevent rebreathing of exhaled air. This study evaluated rebreathing and its consequences when using FFSMs compared to a conventional snorkel. Methods: In a dry environment 20 participants wore three types of snorkel equipment in random order: Subea Easybreath FFSM; QingSong 180-degree panoramic FFSM; and a Beuchat Spy conventional snorkel (with nose clip), in three conditions: rest in a chair; light; and moderate intensity exercise on a cycle ergometer. Peripheral oxygen saturation, partial pressure of carbon dioxide (PCO₂) and oxygen (PO₂) in the end-tidal gas and FFSM eye-pockets, respiratory rate, minute ventilation, were measured continuously. Experiments were discontinued if oxygen saturation dropped below 85%, or if end-tidal CO₂ exceeded 7.0 kPa. Results: Experimental runs with the FFSMs had to be discontinued more often after exceeding 7.0 kPa end-tidal CO₂ compared to a conventional snorkel e.g., 18/40 (45%) versus 4/20 (20%) during light intensity exercise, and 9/22 (41%) versus 3/16 (19%) during moderate intensity exercise. Thirteen participants exhibited peripheral oxygen saturations below 95% (nine using FFSMs and four using the conventional snorkel) and five fell below 90% (four using FFSMs and one using the conventional snorkel). The PCO₂ and PO₂ in the eye-pockets of the FFSMs fluctuated and were significantly higher and lower respectively than in inspired gas, which indicated rebreathing in all FFSM wearers. Conclusions: Use of FFSMs may result in rebreathing due to non-unidirectional flow, leading to hypercapnia and hypoxaemia.

Hjelte C, Plogmark O, Silvanus M, Ekström M, Frånberg O. Risk assessment of SWEN21 a suggested new dive table for the Swedish armed forces: bubble grades by ultrasonography. *Diving Hyperb Med.* 2023 Dec 20;53(4):299-305. doi: 10.28920/dhm53.4.299-305.

Introduction: To develop the diving capacity in the Swedish armed forces the current air decompression tables are under revision. A new decompression table named SWEN21 has been created to have a projected risk level of 1% for decompression sickness (DCS) at the no stop limits. The aim of this study was to evaluate the safety of SWEN21 through the measurement of venous gas emboli (VGE) in a dive series. Methods: A total 154 dives were conducted by 47 divers in a hyperbaric wet chamber. As a proxy for DCS risk serial VGE measurements by echocardiography were conducted and graded according to the Eftedal-Brubakk scale. Measurements were done every 15 minutes for approximately 2 hours after each dive. Peak VGE grades for the different dive profiles were used in a Bayesian approach correlating VGE grade and risk of DCS. Symptoms of DCS were continually monitored. Results: The median (interquartile range) peak VGE grade after limb flexion for a majority of the time-depth combinations, and of SWEN21 as a whole, was 3 (3-4) with the exception of two decompression profiles which resulted in a grade of 3.5 (3-4) and 4 (4-4) respectively. The estimated risk of DCS in the Bayesian model varied between 4.7-11.1%. Three dives (2%) resulted in DCS. All symptoms resolved with hyperbaric oxygen treatment. Conclusions: This evaluation of the SWEN21 decompression table, using bubble formation measured with echocardiography, suggests that the risk of DCS may be higher than the projected 1%.

Nguyen NB, Nguyen Thi HH, Thi HL, Nguyen ST, Nguyen TV. Results of acute cerebral infarction treatment with hyperbaric oxygen therapy, 2020-2022. *Int Marit Health.* 2023;74(4):265-71. doi: 10.5603/imh.97720.

Background: Cerebral stroke is the third leading cause of death after cardiovascular disease, cancer and the leading cause of disability for patients. Hyperbaric oxygen is a non-drug treatment that has the potential to improve brain function for patients with ischaemic stroke. The objective of this study was to evaluate the results of treatment of acute cerebral infarction with hyperbaric oxygen therapy (HBOT). Materials and methods: This was a case-control study. One hundred ninety-five patients diagnosed with cerebral infarction, with signs of onset within 24 hours, were treated at the Centre for Underwater Medicine and Hyperbaric Oxygen of Vietnam National Institute of Maritime Medicine during the period from January 2020 to December 2022. Study group included 100 patients with acute cerebral infarction treated with a combination of HBOT and medication and reference group included 95 patients treated by medication only (antiplatelets drugs,

statins, control of associated risks factors) RESULTS: After 7 days of treatment with HBOT symptoms such as headache, dizziness, nausea, sensory disturbances, and Glasgow score of the study group improved better than that of the reference group ($p < 0.01$). Movement recovery in the study group was better than the reference group: the percentage of patients with mild and moderate paralysis in the study group increased higher than that of the reference group (86.0% and 68.4%), the degree of complete paralysis of the study group decreased more than that of the reference group (14.0% and 31.6%). The degree of independence in daily activities in the study group was better than the reference group. In the study group, the percentage of patients with complete independence in daily life increased from 27.0% to 84.0%. In the reference group, the rate of patients who were independent in their daily activities increased from 37.9% to 51.6%. The average number of treatment days of the study group was 10.32 ± 2.41 days and in the reference group 14.51 ± 3.24 days. Conclusions: Hyperbaric oxygen therapy is a non-drug treatment with many good effects in the treatment of cerebral infarction, especially acute cerebral infarction. HBOT reduces and improves functional symptoms, improves mobility, and reduces treatment time for patients.

Plogmark O, Silvanius M, Olsson M, Hjelte C, Ekström M, Frånberg O. Measuring whole body inert gas wash-out. *Diving Hyperb Med.* 2023 Dec 20;53(4):321-6. doi: 10.28920/dhm53.4.321-326.

Introduction: Quantifying inert gas wash-out is crucial to understanding the pathophysiology of decompression sickness. In this study, we developed a portable closed-circuit device for measuring inert gas wash-out and validated its precision and accuracy both with and without human subjects. Methods: We developed an exhalate monitor with sensors for volume, temperature, water vapor and oxygen. Inert gas volume was extrapolated from these inputs using the ideal gas law. The device's ability to detect volume differences while connected to a breathing machine was analysed by injecting a given gas volume eight times. One hundred and seventy-two coupled before-and-after measurements were then compared with a paired t-test. Drift in measured inert gas volume during unlabored breathing was evaluated in three subjects at rest using multilevel linear regression. A quasi-experimental cross-over study with the same subjects was conducted to evaluate the device's ability to detect inert gas changes in relation to diving interventions and simulate power. Results: The difference between the injected volume (1,996 mL) and the device's measured volume (1,986 mL) was -10 mL. The 95% confidence interval (CI) for the measured volume was 1,969 to 2,003 mL. Mean drift during a 43 min period of unlabored breathing was -19 mL, (95% CI, -37 to -1). Our power simulation, based on a cross-over study design, determined a sample size of two subjects to detect a true mean difference of total inert gas

wash-out volume of 100 mL. Conclusions: We present a portable device with acceptable precision and accuracy to measure inert gas wash-out differences that may be physiologically relevant in the pathophysiology of decompression sickness.

Sunshine MD, Bindi VE, Nguyen BL, Doerr V, Boeno FP, Chandran V, Smuder AJ, Fuller DD. Oxygen therapy attenuates neuroinflammation after spinal cord injury. *J Neuroinflammation.* 2023 Dec 19;20(1):303. doi: 10.1186/s12974-023-02985-6.

Acute hyperbaric O₂ (HBO) therapy after spinal cord injury (SCI) can reduce inflammation and increase neuronal survival. To our knowledge, it is unknown if these benefits of HBO require hyperbaric vs. normobaric hyperoxia. We used a C4 lateralized contusion SCI in adult male and female rats to test the hypothesis that the combination of hyperbaria and 100% O₂ (i.e., HBO) more effectively mitigates spinal inflammation and neuronal loss, and enhances respiratory recovery, as compared to normobaric 100% O₂. Experimental groups included spinal intact, SCI no O₂ therapy, and SCI + 100% O₂ delivered at normobaric pressure (1 atmosphere, ATA), or at 2- or 3 ATA. O₂ treatments lasted 1-h, commenced within 2-h of SCI, and were repeated for 10 days. The spinal inflammatory response was assessed with transcriptomics (RNAseq) and immunohistochemistry. Gene co-expression network analysis showed that the strong inflammatory response to SCI was dramatically diminished by both hyper- and normobaric O₂ therapy. Similarly, both HBO and normobaric O₂ treatments reduced the prevalence of immunohistological markers for astrocytes (glial fibrillary acidic protein) and microglia (ionized calcium binding adaptor molecule) in the injured spinal cord. However, HBO treatment also had unique impacts not detected in the normobaric group including upregulation of an anti-inflammatory cytokine (interleukin-4) in the plasma, and larger inspiratory tidal volumes at 10-days (whole body-plethysmography measurements). We conclude that normobaric O₂ treatment can reduce the spinal inflammatory response after SCI, but pressured O₂ (i.e., HBO) provides further benefit.

Takagi G, Kirinoki-Ichikawa S, Tara S, Takagi I, Miyamoto M. Effectiveness of repetitive hyperbaric oxygen therapy for chronic limb-threatening ischemia. *J Nippon Med Sch.* 2023 Dec 8. doi: 10.1272/jnms.JNMS.2024_91-106. Online ahead of print.

Background: Lower extremity artery disease is strongly associated with morbidity and is typically addressed through revascularization interventions. We assessed the clinical outcomes of patients with chronic limb-threatening ischemia (CLTI) without revascularization who did and did not undergo repetitive hyperbaric oxygen therapy (HBOT). Methods: Between April 2002 and March 2017, the records of 58 patients with CLTI (Rutherford classification

4 in 19% and 5 in 81%) were evaluated retrospectively. HBOT was performed at 2.8 atm of oxygen (HBOT group). The control group included those who could not continue HBOT and historical controls. Patients in poor general health or with an indication for revascularization therapy were excluded. We examined major adverse events (MAEs) and limb salvage rates. Independent predictors and risk stratification were analyzed using a multivariate regression analysis. Results: The mean age was 71±13 years. Of all patients, 67% had diabetes and 43% were undergoing hemodialysis. The mean follow-up period was 4.3±0.8 years. The overall survival rate was 84.5% and 81.0% at 1 and 3 years, respectively. The Cox regression analysis indicated that high body mass index (odds ratio [OR]: 0.86; 95% confidence interval [CI]: 0.76-0.97; p=0.01), well-nourished (OR: 1.21; 95% CI: 1.01-1.45), and HBOT (OR: 0.05; 95% CI: 0.01-0.26; p<0.001) independently predicted absence of MAEs. For major limb amputation, the ankle-brachial index (OR: 0.2; 95% CI: 0.05-0.86; p=0.03) and HBOT (OR: 0.04; 95% CI: 0.004-0.32; p=0.003) were independent predictors. Conclusions: Repetitive, stand-alone HBOT was associated with MAE-free survival and limb salvage in patients with CLTI.

Vrijdag XC, van Waart H, Sames C, Sleight JW, Mitchell SJ. Comparing the EMMA capnograph with sidestream capnography and arterial carbon dioxide pressure at 284 kPa. *Diving Hyperb Med.* 2023 Dec 20;53(4):327-32. doi: 10.28920/dhm53.4.327-332.

Introduction: Capnography aids assessment of the adequacy of mechanical patient ventilation. Physical and physiological changes in hyperbaric environments create ventilation challenges which make end-tidal carbon dioxide (ETCO₂) measurement particularly important. However, obtaining accurate capnography in hyperbaric environments is widely considered difficult. This study investigated the EMMA capnograph for hyperbaric use. Methods: We compared the EMMA capnograph to sidestream capnography and the gold standard arterial carbon dioxide blood gas analysis in a hyperbaric chamber. In 12 resting subjects breathing air at 284 kPa, we recorded ETCO₂ readings simultaneously derived from the EMMA and sidestream capnographs during two series of five breaths (total 24 measurements). An arterial blood gas sample was also taken simultaneously in five participants. Results: Across all measurements there was a difference of about 0.1 kPa between the EMMA and sidestream capnographs indicating a very slight over-estimation of ETCO₂ by the EMMA capnograph, but fundamentally good agreement between the two end-tidal measurement methods. Compared to arterial blood gas pressure the non-significant difference was about 0.3 and 0.4 kPa for the EMMA and sidestream capnographs respectively. Conclusions: In this study, the EMMA capnograph performed equally to the sidestream capnograph when

compared directly, and both capnography measures gave clinically acceptable estimates of arterial PCO₂.

Wu J, McKnight JC, Bønnelycke ES, Bosco G, Giacoin TA, Kainerstorfer JM. Self-calibrated pulse oximetry algorithm based on photon pathlength change and the application in human freedivers. *J Biomed Opt.* 2023 Nov;28(11):115002. doi: 10.1117/1.JBO.28.11.115002. Epub 2023 Nov 23.

Significance: Pulse oximetry estimates the arterial oxygen saturation of hemoglobin (S_aO₂) based on relative changes in light intensity at the cardiac frequency. Commercial pulse oximeters require empirical calibration on healthy volunteers, resulting in limited accuracy at low oxygen levels. An accurate, self-calibrated method for estimating S_aO₂ is needed to improve patient monitoring and diagnosis. Aim: Given the challenges of calibration at low S_aO₂ levels, we pursued the creation of a self-calibrated algorithm that can effectively estimate S_aO₂ across its full range. Our primary objective was to design and validate our calibration-free method using data collected from human subjects. Approach: We developed an algorithm based on diffuse optical spectroscopy measurements of cardiac pulses and the modified Beer-Lambert law (mBLL). Recognizing that the photon mean pathlength ($\langle L \rangle$) varies with S_aO₂ related absorption changes, our algorithm aligns/fits the normalized $\langle L \rangle$ (across wavelengths) obtained from optical measurements with its analytical representation. We tested the algorithm with human freedivers performing breath-hold dives. A continuous-wave near-infrared spectroscopy probe was attached to their foreheads, and an arterial cannula was inserted in the radial artery to collect arterial blood samples at different stages of the dive. These samples provided ground-truth S_aO₂ via a blood gas analyzer, enabling us to evaluate the accuracy of S_aO₂ estimation derived from the NIRS measurement using our self-calibrated algorithm. Results: The self-calibrated algorithm significantly outperformed the conventional method (mBLL with a constant $\langle L \rangle$ ratio) for S_aO₂ estimation through the diving period. Analyzing 23 ground-truth S_aO₂ data points ranging from 41% to 100%, the average absolute difference between the estimated S_aO₂ and the ground truth S_aO₂ is 4.23%±5.16% for our algorithm, significantly lower than the 11.25%±13.74% observed with the conventional approach. Conclusions: By factoring in the variations in the spectral shape of $\langle L \rangle$ relative to S_aO₂, our self-calibrated algorithm enables accurate S_aO₂ estimation, even in subjects with low S_aO₂ levels.

Yang KY, Chen CC. Hyperbaric oxygen therapy in hydrogen sulfide poisoning: a case report. *J Acute Med.* 2023 Dec;13(4):159-61. doi: 10.6705/j.jacme.202312_13(4).0004.

For several decades, hydrogen sulfide (H₂S) has been a toxic gas affecting people, particularly in workplaces.

However, no effective therapy is available to counteract H₂S poisoning. Herein, we report the case of a 34-year-old male field worker who experienced H₂S poisoning due to an accident at work. He presented to the emergency room with dyspnea, drowsiness, and dizziness. Computed tomography revealed a normal brain mass. An initial electrocardiogram revealed sinus tachycardia. Therefore, 10 mL nitrite was administered intravenously. However, the symptoms were not relieved as expected. Hyperbaric oxygen was promptly administered. Symptoms were relieved rapidly after three sessions of hyperbaric oxygen therapy. Subsequently, the patient completely recovered. During severe H₂S intoxication, early administration of hyperbaric oxygen therapy can prevent the disruption of aerobic cellular respiration and save lives.

Yin L, Shao Y. The efficacy of hyperbaric oxygen therapy in patients with diabetes mellitus complicated by peripheral neuropathy. *Altern Ther Health Med.* 2023 Dec 8:AT9800. Online ahead of print.

Objective: To analyze the clinical efficacy of hyperbaric oxygen (HBO) therapy in patients with diabetes mellitus (DM) complicated by peripheral neuropathy. **Methods:** Between September 2019 and April 2021, 90 patients with diabetes and peripheral neuropathy were treated at Qinghai Provincial People's Hospital. Patients in the observation group (n=45) received standard care, whereas those in the experimental group (n=45) received HBO treatment in addition to standard care. After that, the clinical efficacy, nerve conduction velocity, and peak vascular flow rate in the affected limb, as well as serum marker levels and patient comfort, were examined and compared in the two groups. **Results:** Significantly higher total efficacy of treatment was observed in the experimental group compared to the observation group (P<0.05). The nerve conduction velocity and the peak vascular flow rate in the affected limb were both higher in patients belonging to the experimental group than in those in the observation group (P<0.05). The serum levels of vascular endothelial growth factor (VEGF), basic fibroblast growth factor (bFGF), superoxide dismutase (SOD), and malondialdehyde (MDA) of patients in the experimental group were much improved compared to the observation group (P<0.05). Lastly, the comfort after treatment was similar in patients in the two groups (P>0.05). **Conclusion:** HBO treatment has significant therapeutic effectiveness in individuals with diabetes and peripheral neuropathy. This type of therapy not only improves nerve conduction velocity and peak vascular flow rate in the afflicted limb but it also lowers blood marker levels. It also does not contribute to pain during the therapy. Thus, it is a procedure that merits further clinical implementation.

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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