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

E-NEWS

EDITORIAL NOTE – February 2018

The E-News is the monthly newsletter of CUHMA used to share news items and links. We invite your comments and content. We welcome new publication abstracts, news, announcements, research updates, job postings, and images of underwater work. Please submit items by the 25th of each month for inclusion in the next release. Past issues of E-News will be available online at https://cuhma.ca, serving an ongoing role as an information repository.

Neal W. Pollock

NEWS/ANNOUNCEMENTS

Working Diver Knowledge Survey
Health and safety of cold water diving
Santé et sécurité en plongée dans les eaux froides

We are conducting a survey to evaluate the knowledge, knowledge gaps, and concerns of working divers as part of an effort to increase the availability of appropriate educational materials and opportunities to divers. The information gained through the survey will be used to help develop a continuing education workshop and to develop enduring materials available to be made freely available for diver education. We ask for your help through completion of the survey. The survey is available in both French and English through the following link:
http://m.sgizmoca.com/s3/Language-Preference
There is no cost or obligation to participate; input will remain anonymous. This effort was funded by Reseau Quebec Maritime and approved by the institutional review board of Hôtel-Dieu de Lévis,

Call for Abstracts – CUHMA 2018

Both research and review session abstracts will be considered for the 2018 CUHMA annual scientific meeting. The submission deadline is May 15, 2018. Decisions will be returned to corresponding authors by July 15. Proposals and abstracts can be brief, with appropriate titles and 100-150 word descriptions.

STUDENT OPPORTUNITIES

Doctoral Studies in Diving Research

Active recruitment is underway at Université Laval for qualified students wanting to pursue doctoral studies in environmental physiology. The research focus is health and safety in extreme environments, with concentration in decompression stress, monitoring technology, and diver safety. Students will also gain experience with a variety of studies in hyperbaric medicine. Current efforts are funded by the Canadian Institutes of Health Research, Reseau Quebec Maritime, and the Canadian Space Agency. This opportunity is open to highly motivated individuals wanting to dedicate their educational efforts to environmental physiology. Contact Dr. Neal Pollock (neal.pollock@kin.ulaval.ca) for more information. Inquiries would best include concise CVs and a description of key interests and goals.

UPCOMING EVENTS

Health and Safety of Cold Water Diving Workshop

This workshop will be held March 13-14, 2018 (0800-1700), at the Insitut Maritime in Rimouski, QC. Presentations will be provided in a mixture of French and English. Registration is $75, including lunch ($40 for a single day), payable by cheque to Université Laval. Contact Payal Razdan (payal.razdan.1@ulaval.ca) for more information or to register for the meeting. Blocks of rooms have been reserved at the Hôtel Rimouski (starting at $115 per night, plus tax, including parking and wifi; phone 800-463-0755) and the Hôtel L'Empress ($109 per night, plus tax; phone 866-305-6944). Early bookings are recommended.

TEKDiveUSA

TekDiveUSA will be held April 27-28, 2018 in Orlando, FL. This is a biennial advanced and technical diving conference that will draw over 35 USA and overseas specialist companies and offer a wide range of talks and workshops focused on advanced and technical diving, including operational diving, physiology, safety and imaging. For more details, visit: https://tekdiveusa.com.

UMC Diving and Hyperbaric Medicine Course

The 3rd Undersea Medicine Canada Introductory Course in

Diving Medicine - Fitness to Dive program will be held May 07-11, 2018 in Quebec City and Lévis, QC. 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 from the College of Family Physicians of Canada. For more information, contact Debbie Pestell (drdeb1@ns.sympatico.ca; 902-225-8214) or visit: https://underseamedicine.ca. A block of rooms has been reserved at the Sepia Hotel ($130 single / $145 double [plus taxes] including breakfast, parking and wifi; http://www.hotelsepia.ca).

Hyperbaric Medicine Technologist Course

The Environmental Medicine and Physiology Unit at Simon Fraser University is offering a Hyperbaric Medicine Technologist course May 14-26, 2018. For more information, visit: http://www.sfu.ca/science/faculty-support/facilities-services/empu/courses/hyperbaric-medical-technologist.html.

UHMS Annual Scientific Meeting

The Undersea and Hyperbaric Medical Society (UHMS) annual scientific meeting will be held June 28-30, 2018 in Orlando, FL. Visit: https://www.uhms.org. Note: CUHMA members are eligible to receive a 50% discount on UHMS annual membership dues.

Second Tricontinental Scientific Conference on Diving and Hyperbaric Medicine

The second Tricontinental Scientific Conference will be held in Durban, KwaZulu Natal, South Africa, September 23-29, 2018. The week will combine scientific meetings, diving workshops, and social events. The joint organizing committee includes EUBS, SPUMS, SAUHMA and the Scott Haldane Foundation, working with local Durban Hyperbaric Centre staff and a South Africa event management bureau. The weather in September is ideal with temperatures in the low 20s for both land and sea and little chance of rain. For more information, visit: www.tricon2018.org.

CUHMA Annual Scientific Meeting 2018

The 2018 CUHMA ASM will be held in Quebec, QC November 01-04, 2018, hosted by Université Laval and Hôtel-Dieu de Lévis. Two days of workshops will be followed by two days of science talks. Additional events include board and business meetings, and networking sessions. Tentatively planned workshops include:

- Hyperbaric emergency training simulation (HETS)
- 2D ultrasound for decompression research
- Transcutaneous oxygen monitoring (TCOM)
- Problem wound management

An evening reception will be held on November 02 and a banquet on November 03. Visit our website for updates and future registration: https://cuhma.ca.

RECENT PUBLICATIONS

Buzzacott P, Schiller D, Crain J, Denoble PJ. Epidemiology of morbidity and mortality in US and Canadian recreational scuba diving. Public Health. 2018;155:62-8.

OBJECTIVES: This study investigates morbidity and mortality suffered by divers in the USA and Canada. STUDY DESIGN: Prospectively recruited probability-weighted sample for estimating the national burden of injury and a weighted retrospective survey for estimating exposure. METHODS: The National Electronic Surveillance System and Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) were searched for scuba diving injuries. The Divers Alert Network diving fatality database was searched for deaths, and Sports and Fitness Industry Association estimates for diving were obtained from annual surveys. RESULTS: In the USA, there were an estimated 1394 emergency department (ED) presentations annually for scuba-related injuries. The majority (80%) were treated and/or released. There were an estimated 306 million dives made by the US residents 2006-2015 and concurrently 563 recreational diving deaths, a fatality rate of 0.18 per 105 dives and 1.8 per 105 diver-years. There were 658 diving deaths in the US 2006-2015 and 13,943 ED presentations for scuba injuries, giving a ratio of 47 diving deaths in the USA for every 1000 ED presentations. There were 98 cases of scuba-related injuries identified in the CHIRPP data. The prevalence of scuba-related injuries for patients aged 3-17 years was 1.5 per 105 cases, and the prevalence of scuba-related injuries to patients 18-62 years was 16.5 per 105 cases. DISCUSSION: In Canada and the USA, only one out of every 10,000 ED presentations is due to a scuba-related injury. That there are 47 deaths for every 1000 ED presentations for scuba injuries speaks to the relatively unforgiving environment in which scuba diving takes place. For 1.8 deaths per million recreational dives, mortality in scuba diving is nonetheless relatively low.

Camporesi E, Vezzani G, Zanon V, Manelli D, Enten G, Quartesan S, Bosco G. Review on hyperbaric oxygen treatment in femoral head necrosis. Undersea Hyperb Med. 2017;44(6):497-508.

BACKGROUND: Femoral head necrosis (FHN) is a common invalidating disease with an unclear etiology and pathophysiology that affects middle-aged people. FHN may lead to joint collapse and require invasive treatments. Because of its clinical and socioeconomic significance, an early diagnosis, staging and appropriate treatment are required. Unfortunately, to date a unique algorithm for the treatment of FHN has not been defined. OBJECTIVE: In this report we summarize the Tenth European Consensus

Conference on hyperbaric medicine (April 2016, France), during which experts from Europe revised the list of accepted indications for hyperbaric oxygen (HBO_2) treatment, including FHN. METHODS: In this report all aspects of osteonecrosis discussed during the meeting have been considered: pathophysiology, clinical presentation, standard management, HBO_2 therapy and evidence-based review of its efficacy. All observations are based on a thorough review of the best available research and evidence-based medicine. CONCLUSIONS: The Consensus Conference in Lille established FHN as an indication for HBO_2 therapy and suggested a protocols guideline to adopt for this pathology.

Castagna O, Regnard J, Gempp E, Louge P, Brocq FX, Schmid B, Desruelle AV, Crunel V, Maurin A, Chopard R, MacIver DH. The key roles of negative pressure breathing and exercise in the development of interstitial pulmonary edema in professional male scuba divers. Sports Med Open. 2018 Jan 3;4(1):1.

BACKGROUND: Immersion pulmonary edema is potentially a catastrophic condition; however, the pathophysiological mechanisms are ill-defined. This study assessed the individual and combined effects of exertion and negative pressure breathing on the cardiovascular system during the development of pulmonary edema in scuba divers. METHODS: Sixteen male professional scuba divers performed four scuba dives in a freshwater pool at 1 m depth while breathing air at either a positive or negative pressure both at rest or with exercise. Echocardiography and lung ultrasound were used to assess the cardiovascular changes and lung comet score (a measure of interstitial pulmonary edema). RESULTS: The ultrasound lung comet score was 0 following both the dives at rest regardless of breathing pressure. Following exercise, the mean comet score rose to 4.2 with positive pressure breathing and increased to 15.1 with negative pressure breathing. The development of interstitial pulmonary edema was significantly related to inferior vena cava diameter, right atrial area, tricuspid annular plane systolic excursion, right ventricular fractional area change, and pulmonary artery pressure. Exercise combined with negative pressure breathing induced the greatest changes in these cardiovascular indices and lung comet score. CONCLUSIONS: A diver using negative pressure breathing while exercising is at greatest risk of developing interstitial pulmonary edema. The development of immersion pulmonary edema is closely related to hemodynamic changes in the right but not the left ventricle. Our findings have important implications for divers and understanding the mechanisms of pulmonary edema in other clinical settings.

Chen C, Chen W, Li Y, Dong Y, Teng X, Nong Z, Pan X, Lv L, Gao Y, Wu G. Hyperbaric oxygen protects against myocardial reperfusion injury via the inhibition of inflammation and the modulation of autophagy. Oncotarget. 2017 Dec 4;8(67):111522-111534. doi: 10.18632/oncotarget.22869. eCollection 2017 Dec 19.

Our previous study demonstrated that hyperbaric oxygen (HBO) preconditioning protected against myocardial ischemia reperfusion injury (MIRI) and improved myocardial infarction. However, HBO's effect on MIRI-induced inflammation and autophagy remains unclear. In this study, we investigate the potential impact and underlying mechanism of HBO preconditioning on an MIRI-induced inflammatory response and autophagy using a ligation of the left anterior descending (LAD) coronary artery rat model. Our results showed that HBO restored myocardial enzyme levels and decreased the apoptosis of cardiomyocytes, which were induced by MIRI. Moreover, HBO significantly suppressed MIRI-induced inflammatory cytokines. This effect was associated with the inhibition of the TLR4-nuclear factor kappa-B (NF-κB) pathway. Interestingly, lower expression levels of microtubule-associated protein 1 light chain 3B (LC3B) and Beclin-1 were observed in the HBO-treatment group. Furthermore, we observed that HBO reduced excessive autophagy by activating the mammalian target of the rapamycin (mTOR) pathway, as evidenced by higher expression levels of threonine protein kinase (Akt) and phosphorylated-mTOR. In conclusion, HBO protected cardiomocytes during MIRI by attenuating inflammation and autophagy. Our results provide a new mechanistic insight into the cardioprotective role of HBO against MIRI.

Ferreira APP, Vide SS, Fernandes TDF, Coelho PMBS, Camacho ÓF. Hyperbaric oxygen therapy as an adjuvant to source control in necrotizing soft tissue infections. Undersea Hyperb Med. 2017 Nov-Dec;44(6):535-42.

INTRODUCTION: Necrotizing soft tissue infections (NSTI) are rare but potentially lethal disorders, and adequate management is time- and resource-demanding. This study aims to assess whether variations in the treatment modalities - surgery, hyperbaric oxygen (HBO_2) therapy and negative pressure wound therapy - had an impact on the length to definitive source control in NSTI patients who underwent HBO_2. METHODS: This is a retrospective study of all NSTI patients treated with hyperbaric oxygen therapy between March 2007 and May 2015 at Unidade Local de Saúde de Matosinhos (ULSM) Hyperbaric Unit. A multiple linear regression model was used to assess the impact of different treatment modalities in the posdiagnosis time until source control. RESULTS: 58 patients were included; overall mortality was 13.8%. Mean time until source control was 10.4 days (±5.4). All patients were under empiric and broad-spectrum antibiotics on the day of diagnosis. Patients underwent an average of 0.62 (±0.29) surgical interventions and 1.06 (±0.52) HBO_2 sessions per day. The regression model ($R2=0.86$) showed that after adjusting for other covariates, doubling

the number of HBO_2 sessions per day shortened source control by five days (? β = -5.25; 95% CI -6.49 to 4.01), and for each day that HBO_2 was delayed, source control was achieved one day later (β = 1.03; 95% CI 0.82 to 1.24). CONCLUSIONS: More intensive HBO_2 protocols with earlier and more frequent sessions shorten the time until definitive source control in necrotizing soft tissue infections, potentially lowering the impact of systemic effects of infection and complications associated with organ dysfunction.

Korzeniewski K, Krzyżak J. Travel medicine for divers. Int Marit Health. 2017;68(4):215-28.

Recreational diving is increasing in popularity globally, also among European travellers. Since a majority of popular diving sites are located in tropical or subtropical destinations commonly characterised by harsh climate and poor sanitation, travellers planning to engage in recreational diving are recommended to take certain health prevention measures to reduce travel-associated health risks. They need to be aware of the fact that diving can threaten their lives or even be fatal; however, if they are well prepared physically and mentally and follow all the recommended safety rules while underwater, diving is an unforgettable experience that cannot be compared to any other sports activity performed on land. Before going on a diving trip, it is important to make the necessary arrangements, bearing in mind they should not only concentrate on diving-related activities (the marine environment) but also on other aspects, e.g. contact with terrestrial flora and fauna. Therefore, the health prevention measures (a pre-travel consultation, vaccinations, antimalarial chemoprophylaxis, a properly prepared travel health kit and travel insurance) are to keep a traveller healthy during the entire travel and not just the moments of going underwater. The most important of the pre-travel arrangements include pre-travel medical evaluation, selecting and preparing medications for chronic conditions and assembling the first aid kit for personal use. Travellers are recommended to have a pre-travel consultation in medical facilities whose personnel have an appropriate level of knowledge and expertise on hyperbaric, tropical and travel medicine.

Massey H, Leach J, Davis M, Vertongen V. Lost at sea: the medicine, physiology and psychology of prolonged immersion. Diving Hyperb Med. 2017;47(4):239-47.

In most countries, immersion represents the second most common cause of accidental death in children and the third in adults. Between 2010 and 2013, 561 deaths worldwide involving recreational divers were recorded by the Divers Alert Network. Consequently, there is no room for complacency when diving. Being lost at sea is a diver's worst nightmare. In 2006, a diver was lost at sea off the coast of New Zealand for 75 hours. It is unprecedented that, after such a long time immersed in temperate (16-17°C) waters, he was found and survived. His case is presented and utilised to illustrate the many physiological and psychological factors involved in prolonged immersion and what might determine survival under such circumstances. We also briefly review options for enhancing diver location at sea and a few issues related to search and rescue operations are discussed.

Oyaizu T, Enomoto M, Yamamoto N, Tsuji K, Horie M, Muneta T, Sekiya I, Okawa A, Yagishita K. Hyperbaric oxygen reduces inflammation, oxygenates injured muscle, and regenerates skeletal muscle via macrophage and satellite cell activation. Sci Rep. 2018;8(1):1288.

Hyperbaric oxygen treatment (HBO) promotes rapid recovery from soft tissue injuries. However, the healing mechanism is unclear. Here we assessed the effects of HBO on contused calf muscles in a rat skeletal muscle injury model. An experimental HBO chamber was developed and rats were treated with 100% oxygen, 2.5 atmospheres absolute for 2 h/day after injury. HBO reduced early lower limb volume and muscle wet weight in contused muscles, and promoted muscle isometric strength 7 days after injury. HBO suppressed the elevation of circulating macrophages in the acute phase and then accelerated macrophage invasion into the contused muscle. This environment also increased the number of proliferating and differentiating satellite cells and the amount of regenerated muscle fibers. In the early phase after injury, HBO stimulated the IL-6/STAT3 pathway in contused muscles. Our results demonstrate that HBO has a dual role in decreasing inflammation and accelerating myogenesis in muscle contusion injuries.

Perović A, Sobočanec S, Dabelić S, Balog T, Dumić J. Effect of scuba diving on the oxidant/antioxidant status, SIRT1 and SIRT3 expression in recreational divers after a winter nondive period. Free Radic Res. 2018 Jan 15:1-10. doi: 10.1080/10715762.2017.1422211. [Epub ahead of print]

The aim of this study was to examine the effects of scuba diving on oxidative damage markers in erythrocytes and plasma, antioxidant system in peripheral blood mononuclear cells (PBMCs), as well as sirtuin 1 (SIRT1) and sirtuin 3 (SIRT3) gene expressions in recreational divers after a winter nondive period (at least 5 months). For that purpose, 17 male recreational divers performed an immersion at a depth of 30 m for 30 min. Blood samples were collected immediately before and after diving, 3 and 6 h after diving. Erythrocyte lipid peroxidation measured by thiobarbituric-reactive substances (TBARS) method was significantly increased immediately after diving, but returned to the baseline 6 h after diving, while no significant change was found for plasma TBARS and protein carbonyl derivates in both plasma and erythrocytes. Diving-induced catalase (CAT), superoxide dismutase 2 (SOD2), and consequently total superoxide dismutase

(SOD) activities in the PBMC samples (significantly increased immediately after diving, reached the maximum activities 3 h after diving, while 6 h after diving only CAT activity remained significantly increased). No significant change was observed for SOD1 activity and gene expression, as well as SOD2 expression, while CAT and SIRT1 expressions were slightly decreased immediately after diving and 3 h after diving. Interestingly, SIRT3 expression was significantly increased 6 h after diving. In conclusion, after the first dive to 30 m after a nondive season, activation of antioxidant defence was not sufficient to prevent oxidative damage, while SIRT3 upregulation could be a step towards an adaptive response to the diving.

Qin L, Meihua C, Dadong G, Li W, Jinglin W, Xiaoyu D, Mingjun B, Yong Z. Efficacy of combined XingZhi-YiNao granules and hyperbaric oxygen therapy for cognition and motor dysfunction in patients with delayed encephalopathy after acute carbon monoxide poisoning. Evid Based Complement Alternat Med. 2017;2017:1323297. doi: 10.1155/2017/1323297. Epub 2017 Nov 26.

PURPOSE: To investigate the efficacy of XingZhi-YiNao (XZYN) granules and hyperbaric oxygenation (HBO) for cognition and motor dysfunction in patients with delayed encephalopathy after acute carbon monoxide poisoning (DEACMP). METHODS: Eighty-nine patients with DEACMP were randomly divided into control group (n = 19), HBO group (n = 32), and XZYN group (n = 38). All patients received conventional treatment. HBO group received HBO therapy once daily. XZYN group received extra XZYN granules plus HBO treatment. The related indexes including activity of daily living (ADL) scale, Montreal cognitive assessment (MoCA) scale, and mini mental state examination (MMSE) scale were measured. Cerebral white matter injury, age related white matter changes (ARWMC) scale, and the amplitude and latency of P300 were assessed. RESULTS: Compared with control group, the neurological function scores of ADL, MoCA, and MMSE in HBO and XZYN groups were significantly improved, the impairment degree of brain white matter and cognition function were obviously alleviated, the latencies of P300 were significantly shortened, and the amplitudes of P300 were evidently increased ($P < 0.05$). Treatment efficacy of XZYN group was superior to that of HBO group ($P < 0.05$). CONCLUSION: Combined XZYN granules and HBO can significantly improve cognition and motor functions in patients with DEACMP.

Segan L, Permezel F, Ch'ng W, Millar I, Brooks M, Lee-Archer M, Cloud G. Cerebral arterial gas embolism from attempted mechanical thrombectomy: recovery following hyperbaric oxygen therapy. Pract Neurol. 2017 Dec 28. pii: practneurol-2017-001828. doi: 10.1136/practneurol-2017-001828. [Epub ahead of print]

Cerebral arterial gas embolism is a recognised complication of endovascular intervention with an estimated incidence of 0.08%. Its diagnosis is predominantly clinical, supported by neuroimaging. The treatment relies on alleviating mechanical obstruction and reversing the proinflammatory processes that contribute to tissue ischaemia. Hyperbaric oxygen therapy is an effective treatment and has multiple mechanisms to reverse the pathological processes involved in cerebral arterial gas embolism. Symptomatic cerebral arterial gas embolism is a rare complication of endovascular intervention for acute ischaemic stroke. Although there are no previous descriptions of its successful treatment with hyperbaric oxygen therapy following mechanical thrombectomy, this is likely to become more common as mechanical thrombectomy is increasingly used worldwide to treat acute ischaemic stroke.

Shams Z, Khalatbary AR, Ahmadvand H, Zare Z, Kian K. Neuroprotective effects of hyperbaric oxygen (HBO) therapy on neuronal death induced by sciatic nerve transection in rat. BMC Neurol. 2017;17(1):220.

BACKGROUND: Recent studies shows that hyperbaric oxygen (HBO) therapy exerts some protective effects against neural injuries. The purpose of this study was to determine the neuroprotective effects of HBO following sciatic nerve transection (SNT). METHODS: Rats were randomly divided into five groups (n = 14 per group): Sham-operated (SH) group, SH + HBO group, SNT group, and SNT + pre- and SNT + post-HBO groups (100% oxygen at 2.0 atm absolute, 60 min/day for five consecutive days beginning on 1 day before and immediately after nerve transaction, respectively). Spinal cord segments of the sciatic nerve and related dorsal root ganglions (DRGs) were removed 4 weeks after nerve transection for biochemical assessment of malondialdehyde (MDA) levels in spinal cord, biochemical assessment of superoxide dismutase (SOD) and catalse (CAT) activities in spinal cord, immunohistochemistry of caspase-3, cyclooxigenase-2 (COX-2), S100beta (S100ß), and terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) in spinal cord and DRG. RESULTS: The results revealed that MDA levels were significantly decreased in the SNT + pre-HBO group, while SOD and CAT activities were significantly increased in SNT + pre- and SNT + post-HBO treated rats. Attenuated caspase-3 and COX-2 expression, and TUNEL reaction could be significantly detected in the HBO-treated rats after nerve transection. Also, HBO significantly increased S100ß expression. CONCLUSIONS: Based on these results, we can conclude that pre- and post-HBO therapy had neuroprotective effects against sciatic nerve transection-induced degeneration.

Shaw R, Butterworth C, Tesfaye B, Bickerstaff M, Dodd S, Smerdon G, Chauhan S, Brennan P, Webster K,

McCaul J, Nixon P, Kanatas A, Silcocks P. HOPON (Hyperbaric Oxygen for the Prevention of Osteoradionecrosis): a randomised controlled trial of hyperbaric oxygen to prevent osteoradionecrosis of the irradiated mandible: study protocol for a randomised controlled trial. Trials. 2018;19(1):22.

BACKGROUND: Osteoradionecrosis of the mandible is the most common serious complication of radiotherapy for head and neck malignancy. For decades, hyperbaric oxygen has been employed in efforts to prevent those cases of osteoradionecrosis that are precipitated by dental extractions or implant placement. The evidence for using hyperbaric oxygen remains poor and current clinical practice varies greatly. We describe a protocol for a clinical trial to assess the benefit of hyperbaric oxygen in the prevention of osteoradionecrosis during surgery on the irradiated mandible. METHODS/DESIGN: The HOPON trial is a phase III, randomised controlled, multi-centre trial. It employs an unblinded trial design, but the assessment of the primary endpoint, i.e. the diagnosis of osteoradionecrosis, is assessed on anonymised clinical photographs and radiographs by a blinded expert panel. Eligibility is through the need for a high-risk dental procedure in the mandible where at least 50-Gy radiotherapy has been received. Patients are randomised 1:1 to hyperbaric oxygen arm (Marx protocol): control arm, but both groups receive antibiotics and chlorhexidine mouthwash. The primary endpoint is the presence of osteoradionecrosis at 6 months following surgery, but secondary endpoints include other time points, acute symptoms and pain, quality of life, and where implants are placed, their successful retention. DISCUSSION: The protocol presented has evolved through feasibility stages and through analysis of interim data. The classification of osteoradionecrosis has undergone technical refinement to ensure that robust definitions are employed. The HOPON trial is the only multi-centre RCT conducted in this clinical setting despite decades of use of hyperbaric oxygen for the prevention of osteoradionecrosis.

Sønstevold T, Johannessen AC, Reed RK, Salvesen GS, Stuhr L. Hyperbaric oxygen treatment did not significantly affect radiation injury in the mandibular area of rats. Oral Surg Oral Med Oral Pathol Oral Radiol. 2018;125(2):112-9.

OBJECTIVE: Hyperbaric oxygen therapy (HBOT) has been used to enhance microcirculation and thereby oxygen tension in tissues. The present study aimed to investigate the effect of HBOT on radiation injury in the mandibular area of rats. STUDY DESIGN: The left mandibles of rats were irradiated by external radiotherapy (15 Gy every other week for a total of 75 Gy). Four HBOT strategies were used: 2 prophylactic groups receiving HBOT either between each radiation treatment or immediately following terminated radiation treatment, and 2 therapeutic groups receiving HBOT after the latent period of 6 weeks after irradiation either every day (standard HBOT protocol) or 3 days a week for 6 weeks. Tissue samples of the irradiated area were taken from skin, the salivary gland, and the mandible. All tissues were stained with hematoxylin and eosin for morphologic examination. Furthermore, skin samples were stained with CD31 for blood vessel analysis. RESULTS: There was no change in blood vessel density or morphology between controls and HBOT tissues after radiation. The dentin of 2 of the 5 rats that received HBOT either normalized or was not affected by irradiation. CONCLUSIONS: HBOT did not affect radiation injury of the mandibular area in rats within 12 weeks after irradiation.

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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