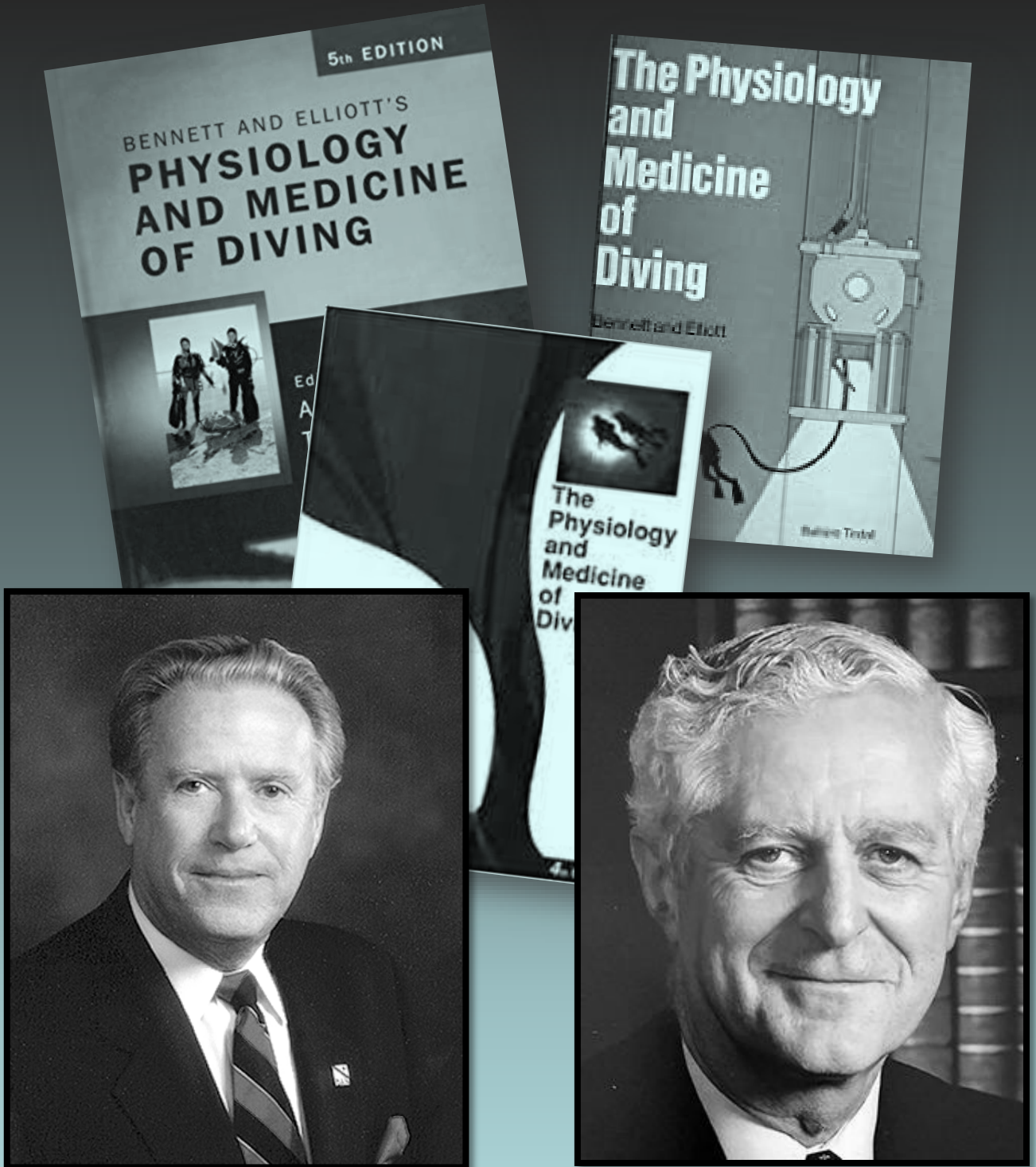


HyperActivity

The Newsletter of the British Hyperbaric Association

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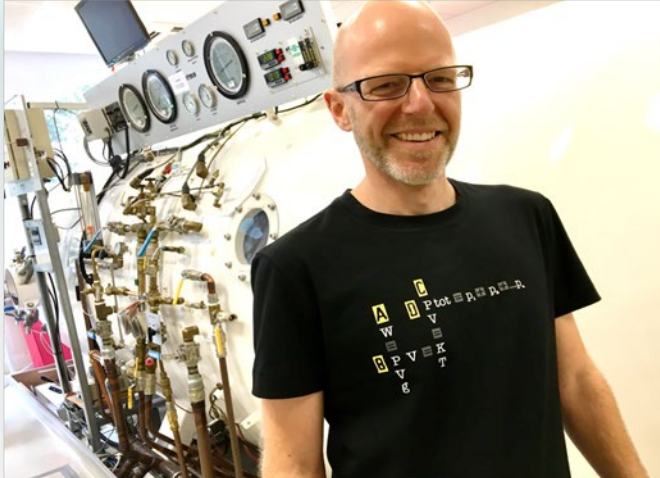


Bennett & Elliott – Alf Brubakk
New facilities at DDRC ... and more!!

HyperActivity

Hyperbaric NEWS

Our Chairman writes (August 2022):



*Oliver Firth,
British Hyperbaric Association Chair*

As I write this in the midst of a burgeoning heatwave it is difficult to cast one's mind back to the all-too-recent winters when wards were overflowing with COVID-19, but cases continue to escalate across Europe. Currently they're being propelled by sub-lineages of the Omicron variant, notably BA.2 and BA.5, with each showing clear transmission advantages over the previously circulating viruses. Rising case numbers inevitably lead to rising hospitalisations, and Europe is still seeing nearly 3000 people die of COVID-19 every week.

The continued evolution of the virus leads to repeated infections with SARS-CoV-2, each with long COVID as a possible consequence. An estimated 2 million people – 3% of the population – suffer from long COVID in the United Kingdom alone. The detection, treatment and rehabilitation of long COVID patients has therefore become something of a shadow pandemic in itself.

A group in Israel led by Shai Efrati has recently published a prospective, randomised, double blind, sham controlled study of 73 patients with ongoing physical, neurocognitive and neuropsychological symptoms after SARS-CoV-2 infection. Their results showed improvement in cognitive and psychiatric symptoms, as well as in fatigue, sleep and pain; effects they attribute to increased brain perfusion and neuroplasticity. Fatigue score and "brain fog" benefitted significantly from HBOT in 10 patients treated at the Midlands Diving Chamber in 2021, and the addition of Post COVID syndrome to the RedCAP registry will hopefully speed the accretion of follow-up data in sufficient quantity to ascertain the role of HBOT in this condition with more certainty. I would encourage all chambers to contribute in any way they can to this vital work.

At the risk of sounding like a broken record, however, I do want to draw attention to an ever growing threat to our specialty: the seemingly unchecked proliferation of unregulated facilities offering mild HBOT for all manner of ailments. Evasion of Care Quality Commission oversight through miniscule website disclaimers whilst appearing to treat disease and disorder is sharp marketing and highly unethical, not to mention potentially fraudulent. I have again written to the CQC to highlight this issue, but given their failure to respond to previous missives I hold out little hope that anything will change until an incident forces their hand. Let us just hope no-one comes to harm in the meantime. Please could anyone aware of operations advertising the provision of HBOT in an unregulated manner make them known to the CQC.

Finally I am very much looking forward to meeting up with all readers in the near future at our upcoming Annual Scientific Meeting, to be held at DDRC this November. Steeped in maritime history and with an enviable selection of gin emporia, Plymouth is a fascinating visit and I can wholeheartedly recommend attendance at this event in person. See you there!

New facilities at DDRC

A phone call on 1st October 2014 and a meeting 3 days later heralded the start of a project that has doubled the size of the Hyperbaric Medical Centre in Plymouth, the venue for this year's BHA Annual Scientific Meeting. The phone call on the 1st was to discuss interest in creating a home for a multi-modal brain research and imaging facility. On the back of that meeting and after 8+ years the Brain Research and Imaging Centre (BRIC) was officially opened in February 2022 by Ann James, CEO University Hospitals Plymouth NHS Trust and Prof Judith Petts, CEO and VC University of Plymouth.



BRIC is a collaborative venture between the University of Plymouth, DDRC and University Hospitals Plymouth NHS Trust. It is now the most advanced multi-modal brain research facility in the South West and provides an amazing research capability in the field of human neuroscience



But BRIC is just part of the story and only occupies around a third of the new space created within the project. A major target for DDRC was to upgrade and expand our teaching and lecture facilities. DDRC Professional Services provides medical training primarily for the maritime and offshore industries and had become confined by lack of teaching space. As a result of the expansion DDRC now has two large teaching rooms which can be combined into a 90+ seated conference room, two smaller seminar rooms and a further teaching room in the old building.

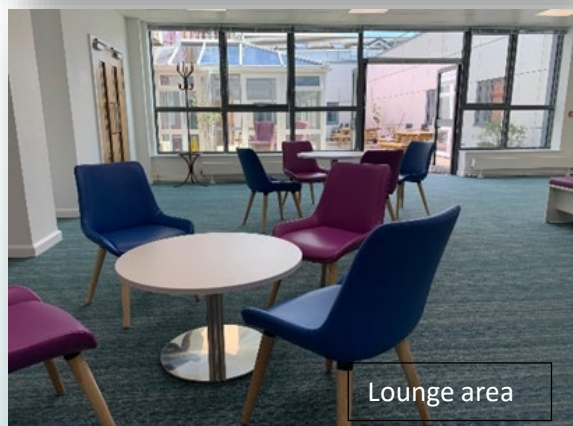
Fortunately, despite a 12 month build taking 24 months the new facilities came online at just the right time in the pandemic to allow us to run courses with students socially distanced at 2m using our flexible lecture room system. Course numbers have been growing ever since. DDRC also provides hyperbaric physician training via taster days and DMAC Level 1 and Level 2D courses – again these are greatly benefitting from the improved spaces. The teaching space account for about a quarter of the new areas created.



So what else did we build? We improved our patient assessment / resuscitation area to create a 3 bed capability. During the covid pandemic this area has also served as a patient waiting and changing area and allowed us to keep our patients, our occupational medicals clients and our training courses zoned into different areas.

DDRC contd

We also created a new lounge area and a comfortable outside courtyard space for everyone to share. This can be used by course attendees, patients, relatives and staff (DDRC and BRIC) to relax and interact.



Looking to the future, a 22m x 8m room was added to allow for further expansion. This is currently serving as a home for some VR research, as well as an occasional teaching space for large groups of students visiting DDRC. But who knows – one day we may even use it to install a new hyperbaric chamber!

Gary Smerdon, DDRC

<https://www.plymouth.ac.uk/research/psychology/brian-research-and-imaging-centre>

New Doctor joins Hull Hyperbaric Team

Mr. Adam Razak MBChB(Hons), FRCS (SN)

Adam is the latest addition to the Hull Hyperbaric Chamber medical team. Appointed as a Consultant Neurosurgeon at Hull University Teaching Hospitals in 2021, Adam has a special interest in neuro-oncological surgery.



“Originally from Manchester, I attended Sheffield University Medical School and later trained as a neurosurgeon within the Humber Deanery, during which time I had the benefit of working with Mr. Mathew. I then undertook a post-training fellowship in Neuro-oncological surgery at Salford Royal NHS Foundation Trust.”

“Upon being appointed as a consultant, Mr. Mathew as the medical director of the chamber, and knowing that my wife Jennifer (a matron in the same hospital as myself) and I are keen sport SCUBA divers, invited me to join the team and develop an interest in diving illness and hyperbaric medicine.”

“My first exposure to the BHA community was at the annual meeting in Oban in November 2021 which was professionally and socially an all-round wonderful experience!”

“In our spare time, my wife and I enjoy travelling the world to tropical diving destinations and have recently exceeded 100 logged dives each. We are both PADI Advanced Open Water and Nitrox/enricher air diver certified.”

Oxymed Australia Pty Ltd and director Malcolm Hooper ordered to pay \$3 million for unlawful advertising of hyperbaric oxygen therapy devices

tga.gov.au; published: 3 December 2021

The Federal Court of Australia has ordered - external site Oxymed Australia Pty Ltd (Oxymed) to pay \$2 million for advertising medical devices intended to administer hyperbaric oxygen therapy in breach of the *Therapeutic Goods Act 1989* (the Act). The devices were advertised for the treatment of serious diseases and medical conditions, including Alzheimer's disease, cerebral palsy, dementia, COVID-19, stroke, HIV/AIDS, cancer, depression and post-traumatic stress disorder.

The Court also ordered Mr Malcolm Hooper, the Director of Oxymed, to pay \$1 million in penalties for aiding, abetting, counselling or procuring the contraventions of the Act by Oxymed.

In making those orders, the Court found that Oxymed's advertising was 'intended to engender in the unscientifically trained and vulnerable reader a perception of credibility as to the claims of [hyperbaric oxygen therapy] as a treatment' for the conditions in issue, and that the use of hyperbaric oxygen therapy to treat most of those conditions was not supported by scientific evidence. The Court further concluded that Oxymed and Mr Hooper 'have a practice of posting pseudo-scientific articles targeted at a vulnerable audience'.

The Court also concluded that, while hyperbaric oxygen therapy presented a limited risk of direct harm to patients, 'there is a potential for significant harm if patients with conditions such as cancer or HIV/AIDS defer or avoid orthodox evidence-based treatment' in favour of pursuing hyperbaric oxygen therapy. There was also a 'risk of substantial financial harm to patients' depending on the duration of the course of treatment.

"The Court's decision indicates the seriousness of the contraventions," TGA head Adjunct Professor John Skerrett said.

"It sends a very clear message to advertisers that they must comply with consumer advertising rules, or otherwise risk enforcement action and significant penalties. We will continue to take appropriate enforcement action against non-compliant advertisers to protect the most vulnerable people in Australia living with serious diseases and conditions".

In March 2020, the TGA fined Oxymed \$63,000 for alleged illegal advertising of the hyperbaric oxygen therapy devices, by issuing a series of infringement notices.

The medical devices advertised on the company's website and Facebook page were not included in the Australian Register of Therapeutic Goods (ARTG). Under the Act, therapeutic goods must be included in the ARTG before they can be lawfully advertised or supplied in Australia, unless a specific exemption applies.

Oxymed advertised on its website and Facebook page, hyperbaric oxygen therapy devices with references to serious forms of a disease, condition, ailment or defect, without being granted relevant authorisation to make the restricted and prohibited representations.

The Court has issued an injunction preventing Oxymed and Mr Hooper from advertising hyperbaric oxygen therapy devices for a period of seven years that have not been included in the ARTG, or in a way that refers to prohibited or restricted representations.

Oxymed and Mr Hooper have been ordered to pay the Department of Health's costs of the court proceedings.

Hull maritime specialist's urgent response to keep stricken Caspian oil and gas dive project on schedule

Business Live, 16 Jun 2022: Two Hull businesses united to provide a rapid response to ensure a major oil and gas project in the Caspian Sea could continue unhindered. Vital diving safety equipment was damaged in Baku, the Azerbaijan capital, as work continued on a critical project for BP.



The country is seen as a key alternative energy source to Russia for Europe, with 22 billion cubic metres of gas exported from the country in 2021, and targets for 24 billion this year.

Mimir Marine, a specialist diver decompression chamber provider, was called upon for a replacement as vital pipeline sections were connected on the seabed, ensuring the major works programme went unhindered.

The firm is a leading global developer and provider of hyperbaric reception facilities, diving and high-altitude pressure vessels for human occupancy.

Saturation divers can require days within units to decompress, as the body adjusts, depending on the depths they worked at.

There for back-up should there be an incident on board a chamber-carrying vessel, normally they are shipped to destinations, but the urgent nature led to an airlift for the safe-haven facility.

Working with specialist shipping, rail and transport firm Myton Law, an 80-tonne unit, with 300 metre-depth rated life support chamber complex, was despatched, arriving on site within 12 hours of leaving the UK - having been readied for transport within two and flown from East Midlands Airport.



Gerard Laden, director of Mimir Marine, told how a unit is always ready to roll on three specially-designed 40ft lowloaders at the Neptune Street base. He said: "Mimir Marine's rapid response to a call for a replacement diver facility after damage had rendered an existing unit unserviceable ensured seamless safe diving could continue.

"The company is known as a global leader for this, we design, manufacture, maintain and operate - with diving contractors - and they feature toilets, showers, beds, living areas and life support redundancy.

"It was designed with air freight in mind, but when global emergencies happen - such as what is going on in Ukraine - these heavy lift aeroplanes can be in high demand. Working with an agent we were able to bring one to immediate notice for mobilisation."

Low-Pressure Portable Hyperbaric Chambers: The Pandora's Box of Hyperbaric Oxygen Therapy

*W.T. Workman, BS, MS, CAsP, CHT-Admin, FAsMA, FUHM
WoundClinic May 2022*

On August 8, 2000, the US Food and Drug Administration (FDA) cleared the first of eight low-pressure, portable fabric hyperbaric oxygen therapy (HBOT) chambers, based upon the Gamow Bag, which was developed for the treatment of acute mountain sickness. Since then, these types of hyperbaric chambers have become endemic.

When I learned of the FDA's decision, I called the FDA's Deputy Director of Compliance for devices at the time and stated that the FDA has just opened Pandora's Box.

At the time, I did not appreciate how prophetic that statement was. Why should anyone worry about the fact that there are a lot of inflatable "altitude sickness" hyperbaric chambers in the USA? Inflatable hyperbaric chambers are cleared by the FDA only for the treatment of acute mountain sickness and they are not FDA cleared for use with 100% oxygen. They are designed to be used with compressed air in order to treat one specific condition. The maximum pressure that they can achieve is the equivalent of about 12 feet of sea water or 3–5 pounds per square inch (PSI), or a maximum of 1.4 atmospheres absolute (ATA). By comparison, "hard sided" hyperbaric chambers provide treatments at 2 ATA (33 fsw) or greater. While there is a lot to be said about this issue, I am going to focus on the issues relevant to safety and compliance with legal requirements.

There are two engineering and operational safety codes that relate specifically to the design, fabrication, testing, installation and operation of clinical hyperbaric chambers: the American Society of Mechanical Engineers' Pressure Vessels for Human Occupancy Code (ASME PVHO-1) and the National Fire Protection Association's NFPA 99, Fire Safety Code for Health Care Facilities.^{1,2} More specifically, the hyperbaric requirements of NFPA 99 require that all clinical hyperbaric chambers comply with the requirement of the ASME PVHO-1 Code. The FDA formally recognizes these two codes when evaluating a new hyperbaric chamber system for clearance via the Premarket Notification Process or FDA 510k submission, yet the FDA has cleared several companies that produce these low-pressure, portable fabric hyperbaric chambers even though they do not meet the code requirements that they formally recognize.

Why Compliance Matters

None of the low-pressure, portable fabric hyperbaric chambers is compliant with ASME PVHO-1 or NFPA 99. Why does that matter?

It is important to note that the FDA specifically prohibits the use of oxygen cylinders or oxygen concentrators with these low-pressure, portable fabric hyperbaric chambers.

Eleven states have statutes that mandate compliance to ASME PVHO-1 for any clinical hyperbaric chamber in operation in their respective state. They are Arkansas, California, Delaware, Georgia, Hawaii, Minnesota, North Carolina, Oregon, Tennessee, Washington, and Wisconsin.³ Accordingly, in those states, it is against the law to provide clinical hyperbaric oxygen therapy using a device that does not meet this safety code. So, if there are these states in which hyperbaric chamber must comply with ASME-PVHO-1, why are dozens, if not hundreds, of these chambers being used for clinical hyperbaric oxygen therapy treatment in each of these states?

The explanation is very simple: the authority having jurisdiction (AHJ: state/local fire marshal, state pressure vessel inspector, etc.) does not know these chambers are operating in their jurisdiction. If a hospital or doctor's office wishes to install a traditional hyperbaric chamber (such as from Sechrist, Perry, PAHI, Fink, etc.) they must have a piping permit. This permit is reviewed and approved by the local fire marshal's office so he/she knows that a clinical hyperbaric chamber is coming into their jurisdiction.

All of these low-pressure, portable fabric chambers are shipped to a facility in 3–5 boxes by FedEx, UPS, etc., totally bypassing the fire marshal. They can be assembled and operational in less than 30 minutes. The local AHJ cannot provide oversight of chambers that he/she does not know exist. However, as only one example, once the state fire marshal of Georgia learned of their state's statute, he started coordinating a statewide initiative to stop the use of these chambers for clinical hyperbaric services across the state of Georgia.⁴

Unfortunately, not all states and/or jurisdictions have adopted NFPA 99 as a mandatory code. In the absence of mandating NFPA 99, many jurisdictions have adopted either the International Fire Code or the International Building Code. Each of these alternative codes make direct reference to complying with NFPA 99 and its specific requirements for hyperbaric facilities. The same endorsement is found in NFPA 101, Life Safety Code which is adopted in all 50 states. Therefore, in

my opinion, both ASME PVHO-1 and the hyperbaric chapter of NFPA 99 have become a national requirement. In other words, all states must comply with the relevant part of NFPA 99 when it comes to the equipment used to provide clinical hyperbaric treatments.

Since September 2021, it has been discovered that there are hundreds, if not thousands, of non-compliant and low-pressure, portable fabric hyperbaric chambers that are being illegally exported to the US from Argentina, Austria, Canada, China, Germany, Peru, and South Korea. It is likely that other countries are producing them that we do not even know about. These chambers have not been cleared for use in the U.S. by the FDA and none meet the aforementioned safety codes. There are at least 10 US companies that are known to be contributing to this illegal activity by distributing them. These companies are also in violation of US customs regulations related to the importation of medical devices into the US. With limited exceptions, these chambers are not being logged on shipping manifest as hyperbaric chambers but as an "inflatable bag with oil-less compressor," etc.⁵ To be clear, it is not just the use of these chambers for clinical hyperbaric treatment which is illegal (under medical safety laws), but the importation/distribution of them is also illegal under different laws.

In light of the above, who are the customers for these illegal portable chambers? The manufacturers and U.S. distributors are targeting chiropractors, naturopathic doctors, functional medicine physicians, wellness centers, spas and lay people. Many of these individuals or practices are promoting the use of these low-pressure, fabric chambers for the treatment of mainstream hyperbaric indications (eg, diabetic foot ulcers, late effects of radiation), as well as for "off-label" uses such as persistent COVID-19 symptoms, cancer, etc. Neither the facilities nor the manufacturers mention the fact that these low-pressure chambers cannot achieve a therapeutic dose of oxygen for any of the recognized hyperbaric indications. This misleading omission may lead patients to believe that they are receiving a medical treatment when in fact, they are not. Keep in mind that patients are also likely paying cash for these treatments.

What the FDA Requires

It is important to note that the FDA specifically prohibits the use of oxygen cylinders or oxygen concentrators with these low-pressure, portable fabric hyperbaric chambers. Despite this, virtually every one of these chambers are being sold with oxygen concentrators. Unfortunately, even though the pressures achieved by these inflatable devices is insufficient to provide medical benefit, it is

[continued ...] sufficient to make them very dangerous in terms of fire risk.

To the FDA's credit, they are aware of the way these chambers are being promoted and used. The FDA has actually issued two consumer warnings urging the public to not be misled about unproven claims of efficacy and the potential dangers of these inflatable devices.⁶ In its most recent warning, the FDA even recommended that patients seeking hyperbaric treatment do so in a legitimate hyperbaric facility that has been accredited by the Undersea & Hyperbaric Medical Society (UHMS). I endorse that recommendation by the FDA. (By full disclosure, before my retirement from the UHMS, I managed the Society's clinical facility accreditation program.)

With regard to chiropractors, there are 19 states that have medical practice acts that prohibit chiropractors from administering oxygen, using hyperbaric chambers or both. My preliminary search revealed that in every one of the 19 states in which it is prohibited, there are chiropractors actively offering "hyperbaric oxygen" treatments with inflatable devices. If a cursory internet search is sufficient to demonstrate widespread disregard of these laws, it is likely that the problem is much bigger than we know.

There is a large "wellness company" that has over 130 locations in close to 30 states. The company offers hyperbaric oxygen therapy as a treatment for various maladies. None of the chambers in operation at these locations is code compliant with either ASME PVHO-1 or NFPA 99. That is just one national company—there are others. Additionally, there are at least 300 independents centers⁷ that are offering treatment in these illegal chambers across the nation—and those are just the ones that have been discovered!

Conclusion

There are many, many practitioners advertising that they offer "hyperbaric oxygen therapy" but using equipment that is not cleared for use by the FDA at all, or if cleared for use by the FDA, is only cleared for the treatment of altitude sickness. None can be legally pressurized with oxygen. Depending on the state and the practice act of the clinician, the practitioner may be at risk of the loss of their professional license and in violation of several laws. None of these chambers meets current safety codes.

What can you do to help put the lid back on Pandora's Box? First, know your community. Learn those centers that might be promoting the use of inflatable chambers which may not comply with recognized codes and standards. Then, do not be afraid to open a dialogue with your local fire marshal.

Next, if you have not already done so, establish a relationship with the local first responders, who would be the first to arrive at any facility offering hyperbaric oxygen therapy, including your own facility. Many of these professionals have never seen a hyperbaric chamber before and are not aware of the medical or fire problems they may be called upon to manage in relation to them. The NFPA requires an annual "worse-case scenario" fire drill to be conducted. To optimize that drill for everyone, involve the local first responders. You will improve the safety of your own facility, and you can also educate your local fire marshal and fire fighting community as to the possible existence of unsafe operations.

Finally, for those of you who reside in one of the 11 states with mandatory ASME-PVHO-1 laws on the books, engage your state fire marshal and pressure vessel inspector (usually under the Labor Department) and let them know if there is a known or suspected center operating these illegal chambers. The sad reality is that if there is a catastrophic event at one of these illegal operations, the impact will not be limited to the unfortunate people involved. Legitimate hyperbaric operations will be impacted by the negative press and subsequent patient fear.

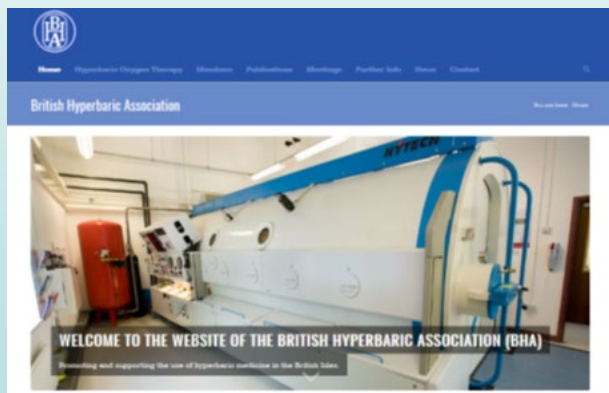
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7. Personal online search, various dates in 2022

The BHA website

Please visit the BHA website regularly and check all your unit details for accuracy:

<http://www.ukhyperbaric.com/>



Gerard Laden, BSc

DOI:<https://doi.org/10.1016/j.ijrobp.2021.11.015>

Randomised controlled trials (RCT's) are a reliable form of scientific evidence and strongly influence healthcare policy and practice. The words, randomized control trial are eye catching, conveying reliability and trust. Publishing negative as well as positive findings is appropriate. Whilst reviewing the results of the HOPON (hyperbaric oxygen for the prevention of osteoradionecrosis) RCT, in *The International Journal of Radiation Oncology Biology Physics* 2019; 104:530-539,¹ I eventually came to appreciate this RCT had neither a positive nor negative outcome, rather at interim analysis it was discovered the trial was significantly underpower due to an overestimation of the incidence of ORN, at 18.5%, incidence at analysis 6%. Previously published systematic reviews^{2,3,4} reported the incidence of ORN at around 7%. It is a regrettable reality that many journal readers will only take note of an article's Title, "summary box", "abstract" and or "conclusion". Unfortunately, the HOPON trial authors failed to use one of these four opportunities to inform the reader the trial was stopped early. Statistical analysis of an underpower trial, that also only recruited 50% of the planned patients is bound to produce inconclusive results.

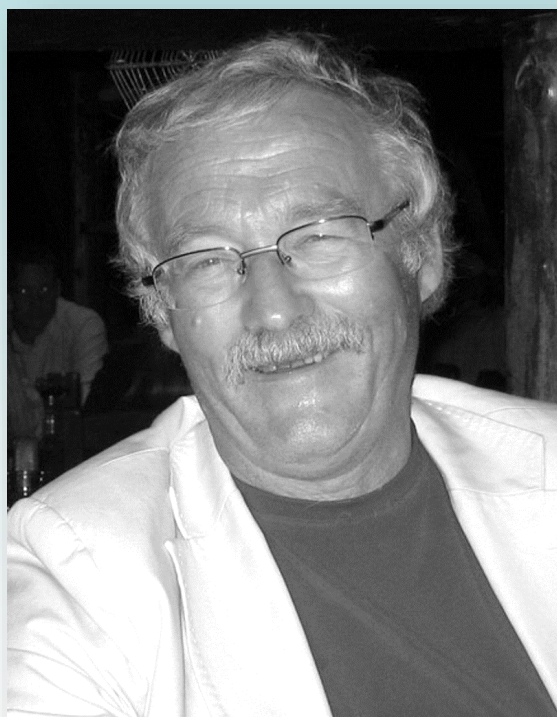
Further detracting from the value of an underpower trial, the authors of HOPON appear to be in two minds about interpreting their own data; on the one hand stating "The results of this multi-center, randomized, controlled trial refute earlier positive results for hyperbaric oxygen therapy in the prevention of mandibular osteoradionecrosis" whilst also stating "the rate of ORN was much less than assumed, precluding statistically significant efficacy analysis for HBO"

In a more recent "critical review" in this journal "Osteoradionecrosis: exposing the evidence not the bone"⁵ Frankart and colleagues report they "examined the existing literature and present an updated, multidisciplinary, and comprehensive review for ORN with a focus on data from the last decade". In the section, "Procedural intervention" and hyperbaric oxygen, they describe "a major recent study on this topic was the randomised, phase 3 HOPON trial"¹ and report on some trial data. Again, the readers are not advised this "major" trial was underpowered and stopped early.

Randomised controlled trials are a powerful and significant resource, underpower RCT are of uncertain value and when published or referenced the reader needs to be advised of this vital characteristic. I agree with Frankart and colleagues "exposing the evidence" is important it provides the reader context for the data being reported.

OBITUARY

Professor Alf O Brubakk MD, PhD



Alf Brubakk was born in 1941 in Bergen, Norway. His doctorate degree was awarded by Justus Liebig University Giessen in Hessen, Germany.

With only two Norwegian medical facilities in Bergen and Oslo, Alf was asked to establish one in Trondheim. In 1970, in collaboration with Rune Aaslid, a mathematical model of the cardiovascular system was constructed that could be used clinically along with a pulsed echo Doppler flowmeter to record blood flow velocity in the aorta and heart. Jarle Holen's work led to ultrasound measurements being possible to obtain intracardiac pressure non-invasively thus avoiding heart catheterisation.

By 1978, Alf had submitted his doctoral thesis "*Methods for studying flow dynamics in the left ventricle and the aorta in man: use of a simulation model and ultrasound.*" At the beginning of offshore oil exploration in the North Sea, Bård Holand, an experienced commercial diving friend, suggested ultrasound's usefulness in studying decompression in diving which led to several ultrasound studies of experimental dives to 500 metres at the Norwegian Underwater Institute in Bergen.

Alf and colleagues were the first to show that physical exercise could significantly reduce bubble formation and hence reduce the risk of injury. Over his career he published over 150 scientific papers, co-edited Bennett and Elliott's 5th edition of *The Physiology and Medicine of Diving*, and in the last 20 years alone supervised 15 Masters and 10 PhD students.

Alf's two major influencers were Professor Jens Glad Balchen, who believed in the importance of having a basic idea to follow through to the end, regardless of opposition, and John Scott Haldane, the first environmental physiologist who showed the value of using basic physiology to understand man's response to his environment.

With Bård Holland, Alf conducted extreme environmental survival courses in Svalbard over a 20-year period. He served in various capabilities on the Diving Medical Advisory Committee, European Underwater Baromedical Society, European Diving Technology Committee, and received the Undersea and Hyperbaric Medical Society's Behnke Award twice.

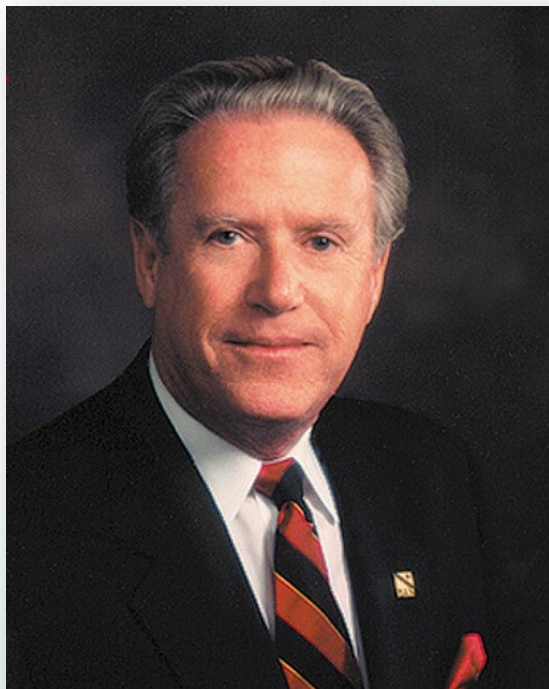
Alf passed away on 5th April 2022.

Dr Michael Lang

Edited from Diving and Hyperbaric Medicine

OBITUARY

Peter Bennett, PhD, DSc



Dr Peter Bennett, founder and former president of the Divers Alert Network (DAN) has died at the age of 91.

Born in Portsmouth, UK, on 12 June 1931, Bennett graduated with a Bachelor of Science degree from the University of London, and was subsequently employed by the Royal Navy Physiology Laboratory, where he worked for the next 20 years, completing his Doctorate in 1964 at the University of Southampton.

Bennett was a founding member of the Undersea Medical Society – now the Undersea & Hyperbaric Medical Society – later serving as its president and executive director.

He moved to America in 1972, where he became director of the Hyperbaric Centre at California's Duke University Medical Centre. It was here that he is credited with the invention of trimix as a breathing gas, and subsequently the discovery of high pressure nervous syndrome (HPNS).

The concept of a 24-hour telephone service for diving medical emergencies was first tabled by the Undersea Medical Society in 1977, and in 1980, Bennett received a grant from National Oceanic and Atmospheric Administration (NOAA) and National Institute for Occupational Safety and Health (NIOSH), with which he formed the 'National Diving Accident Network', renamed the Diver's Alert Network in 1982 after implementing a telephone line for non-emergency queries from recreational divers.

Bennett oversaw the process of turning DAN into the International safety body it is today began in 1991, amalgamating organisations such as Europe's International Diving Association and Japan's Civil Alert Network under the same brand name of International DAN, and bringing in DAN Asia Pacific in 1994 and DAN Southern Africa in 1996.

Today, the Divers Alert Network includes offices for DAN World: Latin America – Caribbean (LAC), DAN World: Asia Pacific (AP), DAN Europe, DAN China, DAN Japan and DAN Southern Africa.

Bennett received the 2002 DEMA Reaching Out Award for his outstanding contribution to the diving industry, before stepping down as president in 2003. He stepped down as President of the Divers Alert Network of America on 30 June 2003. He served as DAN's Executive Director until 2007, after which he became executive director of the Undersea and Hyperbaric Medical Society, where he remained until 2014.

'In founding DAN, Dr Bennett accomplished something truly remarkable,' said current DAN president and CEO Bill Ziefle. 'It is because of his vision and action that divers all over the world now have the support of an organization that stands ready to assist in the event of an emergency. Dr Bennett's inquisitive mind and drive to achieve were gifts to divers everywhere.'

'Peter Bennett dedicated his life to the advancement of diving,' said DAN's medical director Jim Chimiak, MD. 'Few equal his combined accomplishments as a researcher, organiser, and leader in diving medicine. He will remain a profound influence on everyone working in this increasingly important area of human endeavour. He displayed an infectious, pioneering spirit that rallied expert, worldwide collaborations that routinely accomplished the impossible. He was a great mentor and friend who will be truly missed.'

OBITUARY

Surg Cdr David Hallen Elliott OBE RN



Professor David Elliott crossed the bar on Tuesday 18 January 2022. He was 89.

David will be well known to the 'old and bold' for his practical diving medicine and research during the 1960s and 1970s at INM (Institute of Naval Medicine) and RNPL (Royal Naval Physiological Laboratory) at Alverstoke and AEDU (Admiralty Experimental Diving Unit) at HMS Vernon and his service as the medical officer of HMS Reclaim during many air and heliox deep diving trials and operations.

He contributed the 'Diving Accident' chapters to BSAC manuals and held a position of Technical Advisor on the Council of the National Underwater Instructors Association. His professional book entitled *'The Physiology and Medicine of Diving and Work in Compressed Air'*, co-authored with Dr P B Bennett, became the standard reference work in the field. In 1969, he became Honorary President of the Southsea Branch of the BSAC (British Sub Aqua Association).

David left the Royal Navy in 1976 to pursue an illustrious career in civilian life during which he published many important research papers. He was also the Chief Medical Officer of Shell UK, a renowned expert witness in diving related legal cases and an active Vice President of the HDS (Historical Diving Society). As recently as 2012, he was reappointed as a Civilian Consultant in Diving Medicine and Physiology to the Royal Navy for a further three years.

He is survived by his wife June, their children Jo, Kathy, Susie and Pippa, and their nine grandchildren.

Historical Diving Society

David Elliott was a strong, caring, and fair man with a good sense of humour, who was well respected by all who knew him.

He started his career in medicine qualifying with honours and was awarded a mark of distinction in obstetrics and gynaecology at St Bartholomew's Hospital Medical College in 1956. This is where he met his future wife, June Carlton, a nurse, whom he married in 1960 and very much loved until his death.

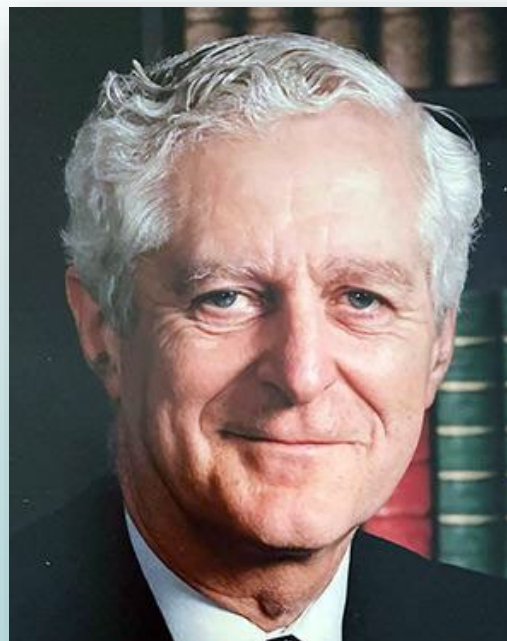
He was awarded his DPhil by Oxford University in 1964 which nurtured a lifelong interest in research. He did his national service in the Royal Navy as a surgeon lieutenant commander and then specialised in research in underwater medicine, including three years at the National Institutes of Health in Bethesda, USA (1969-72). His dedication and achievement were recognised with an OBE.

In 1976 he was appointed chief medical officer for Shell UK, caring for those involved in the oil industry. After leaving Shell in 1989, he became a professor of occupational medicine at the Robens Institute in Guildford. He wrote textbooks on diving medicine, enjoyed lecturing, and was also an expert witness on numerous complex legal cases after diving accidents.

He leaves June, to whom he was married to for 62 years; four daughters; and nine grandchildren, who will all miss him deeply.

Professor of Occupational Medicine Robens Institute, Guildford (b 1932; q St Bartholomew's Hospital 1956; OBE, DPhil), died from cancer on 18 January 2022

BMJ 2022;376:o215



RECENTLY PUBLISHED RESEARCH (1)

We invite members to submit abstracts or references of recently published papers that they think may be of interest to the general BHA membership. Priority will be given to papers published in journals not normally associated with hyperbaric research. Listing here is based on web-based searches only; quality is not inferred!!

HYPERBARIC MEDICINE

A case report: Treatment of chronic diabetic foot ulcer with hyperbaric oxygen therapy. By: Jeffrey, C. W. Chau; Joe, K. S. Leung. *JOURNAL OF ORTHOPAEDICS TRAUMA AND REHABILITATION* Volume: 28 Published: MAY 10 2021

A COVID-19 infection incidentally detected during hyperbaric oxygen treatment and preventive measures for COVID-19 transmission in a multiplace hyperbaric chamber. Demir, AE; Ilbasimis, S; Toklu, AS. *DIVING AND HYPERBARIC MEDICINE* Volume: 52 Issue: 1 Pages: 58-62 Article Number: PMID 35313375 DOI: 10.28920/dhm52.1.58-62 Published: MAR 2022

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A diving physician's experience of dental barotrauma during hyperbaric chamber exposure: case report. Altun, BD; Sumen, SG; Dumlu, A. *DIVING AND HYPERBARIC MEDICINE* Volume: 52 Issue: 1 Pages: 63-65 Article Number: PMID 35313376 DOI: 10.28920/dhm52.1.63-65 Published: MAR 2022

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A narrative review of adjuvant therapy for glioma: hyperbaric oxygen therapy. By: Xue, Tao; Ding, Jia-Sheng; Li, Bing; et al. *MEDICAL GAS RESEARCH* Volume: 11 Issue: 4 Pages: 157-155 Published: OCT-DEC 2021

A photographic case of frostbite treated with delayed hyperbaric oxygen therapy. Davis, A; Sinopoli, B; Mann, N; Stenbit, AE. *HIGH ALTITUDE MEDICINE & BIOLOGY* Volume: 23 Issue: 2 Pages: 194-197 DOI: 10.1089/ham.2021.0047 Early Access Date: JAN 2022 Published: JUN 1 2022

A systematic review to assess the impact of hyperbaric oxygen therapy on glycaemia in people with diabetes mellitus. By: Baitule, Sudhanshu; Patel, Aaran H; Murthy, Narasimha; et al. *MEDICINA* Volume: 57 Issue: 10 Published: 2021 Oct 19

Abnormal motor blockade after epidural analgesia caused by pneumorrhachis and the role of hyperbaric oxygen treatment: a case report. Romano-Ribeiro, C; et al.. *DIVING AND HYPERBARIC MEDICINE* Volume: 52 Issue: 1 Pages: 54-57 Article Number: PMID 35313374 DOI: 10.28920/dhm52.1.54-57 Published: MAR 2022

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Acute effect of hyperbaric oxygen therapy on macular and choroidal thickness in patients with type 2 diabetes and diabetic foot ulcers: Optical coherence tomography based study. Gun, RD; Gumus, T; Kardas, ASY; Kardas, G. *PHOTODIAGNOSIS AND PHOTODYNAMIC THERAPY* Volume: 39 Article Number: 102926 DOI: 10.1016/j.pdpdt.2022.102926 Published: SEP 2022

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Adjuvant topical oxygen therapy for wound healing in patients with peripheral arterial disease. Vulakh, GM; Hingorani, AP; Ascher, E; Marks, N. *VASCULAR* Article Number: 17085381221080270 DOI: 10.1177/17085381221080270 Early Access Date: MAR 2022

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Comparison of outcomes after primary artificial urinary sphincter placement in post-radiation patients with and without hyperbaric oxygen therapy. By: Nealon, Samantha; Balbona, Joseph; Wiegand, Lucas. *JOURNAL OF UROLOGY* Volume: 206 Supplement: 3 Pages: E384-E385 Meeting Abstract: PD22-12 Published: SEP 2021

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Comparison of venous, capillary and interstitial blood glucose data measured during hyperbaric oxygen treatment from patients with diabetes mellitus. By: Baines, Carol; Vicendese, Don; Cooper, David; et al. *DIVING AND HYPERBARIC MEDICINE* Volume: 51 Issue: 3 Pages: 247-240 Published: 2021 -Sep-30

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Delayed neurological sequelae successfully treated with adjuvant, prolonged hyperbaric oxygen therapy: review and case report. Martani, L; et al. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH* Volume: 19 Issue: 9 Article Number: 5300 DOI: 10.3390/ijerph19095300 Published: MAY 2022

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Does hyperbaric oxygen pretreatment with 100% oxygen attenuate tourniquet-induced acute ischemia-reperfusion injury in mouse hindlimb? By: Frisby, Devin; Tu, Huiyin; Zhang, Dongze; et al. *FASEB JOURNAL* Volume: 35 Special Issue: SI Supplement: 1 Published: MAY 2021

Does hyperbaric oxygen therapy facilitate peripheral nerve recovery in upper extremity injuries? A prospective study of 74 patients. Ince, B; et al. *EUROPEAN JOURNAL OF TRAUMA AND EMERGENCY SURGERY* DOI: 10.1007/s00068-022-01920-3 Early Access Date: FEB 2022

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Efficacy of hyperbaric oxygen therapy for diabetic foot ulcers: An updated systematic review and meta-analysis. Zhang, ZM; Zhang, WJ; Xu, YQ; Liu, DW. *ASIAN JOURNAL OF SURGERY* Volume: 45 Issue: 1 Pages: 68-78 DOI: 10.1016/j.asjsur.2021.07.047 Early Access Date: DEC 2021 Published: JAN 2022

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Hyperbaric and diving medicine meetings and conferences in 2022 - 2023

SPUMS 2023

03-09 June, 2023
Cairns, Australia



Diver health and ocean health amid the storm clouds of climate change: A shared vision for underwater medicine and marine science. Health Impacts of climate change

- Temperate spread of tropical diseases
- Unexpected consequences – marine food poisons and envenomation
- Creative solutions for the impacts of climate change
- Marine Infections
- Paediatric Diving – workshop and position statement

In-water practical sessions on Wednesday 7 and Friday 9 June

- Add-on Dives to the Dreamtime Expedition Tuesday 6 June.
- Pre- and Post-conference trips

Website: www.spums.au/index.php/asm-registration



UHMS 2023

16-18 June, 2023
Sheraton San Diego Hotel & Marina, CA



The UHMS Annual Scientific Meeting will be held in the **Sheraton San Diego Hotel & Marina, San Diego, CA**. Pre-courses have not yet been announced.

Website: www.uhms.org

2024 meeting: June 14-16, 2024. Astor Crowne Plaza New Orleans, LA

EUBS 2023

13-16 September, 2023
Porto, Portugal



Website: <https://eubs2023.com/> 'more info coming'

EUBS 2024 – Brest, France

EUBS 2025 – Finland

EUBS 2026 – Barcelona, Spain (tbc)



Aberdeen

Aberdeen Royal Infirmary, Foresterhill,
Aberdeen AB25 2ZN
Daytime & Emergency Telephone: 0345 408 6008
Clinical Lead NHS Grampian Hyperbaric Service: Dr
Ruth Stephenson
Email: ruth.stephenson@nhs.scot
Web Site: www.sdm.scot.nhs.uk

Chichester

Hyperbaric Medicine Unit, St Richard's Hospital,
Spitalfield Lane, Chichester, West Sussex PO19 6SE
Daytime Telephone: 01243 788122 Ext 2504
Principal Medical Director: Dr Mark Glover.
Email: mark@mmmglover.onmicrosoft.com

Great Yarmouth

East of England Hyperbaric Unit, Lowestoft Road,
Gorleston, Great Yarmouth, Norfolk NR31 6LA
Daytime Telephone: 01493 452452
Emergency Telephone: 01493 452452
Principal Medical Director: Dr Pieter Bothma.
Email: pabothma@nhs.net; pabothma@gmail.com

Hull

North of England Medical Hyperbaric Unit,
SPIRE Hospital, Lowfield Road, Anlaby, Hull HU10 7AZ
Principal Medical Director: Bruce Mathew
Daytime Telephone: 01482 659471
Emergency Telephone: 01482 659471

London (Whipps Cross)

London Hyperbaric Medicine, Whipps Cross University
Hospital NHS Trust, Leytonstone, London E11 1NR
Principal Medical Director: Dr Pieter Bothma
Daytime Telephone: 020 8539 1222
Emergency Telephone: 07999 292999
Email: mail@londonhyperbaric.com
Web Site: www.londonhyperbaric.com

Midlands Diving Chamber

Redwood House, Hospital of St Cross, Barby Road,
Rugby, Warwickshire, CV22 5PX
Principal Medical Director: Dr Michael Gonevski
Daytime Telephone: 01788 579555
Emergency Telephone: 07940 353816
Email: doctor@midlandsdivingchamber.co.uk
Web Site: www.midlandsdivingchamber.co.uk

Oban

West Scotland Centre for Diving and Hyperbaric
Medicine
Tritonia Scientific Ltd., Dunbeg,
Oban, Argyll PA37 1QA
Principal Medical Director: Dr F. MacLennan
Daytime Telephone: 01631 559211
Emergency Telephone: 0345 408 6008
Email: fiona.maclennan3@nhs.scot
Email: martin.sayer@tritoniascientific.co.uk

Orkney

Orkney Hyperbaric Unit
Old Academy Back Road, Stromness
Orkney KW16 3AW
Principal Medical Director: Dr A Trevett
Daytime Telephone: NHS Orkney 01856 888000
Emergency Telephone: Coastguard 999
or 0345 408 6008
Email: andrew.trevett@nhs.scot

Plymouth

DDRC Healthcare, Plymouth Science Park,
Plymouth,
Devon PL6 8BU
Principal Medical Director: Dr Doug Watts
Daytime Telephone: 01752 209999
Emergency Telephone: 08702 385001
Email: info@ddrc.org
Web Site: www.ddrc.org

Wirral

N W Emergency Recompression Unit, Murrayfield
Hospital, Holmwood Drive, Thingwall Wirral
CH611AU
Principal Medical Director: Dr Tristan Cope
Daytime Telephone: 0151 648 8000
Emergency Telephone: 0151 648 8000
Email: tristan.cope@hyperbaric-medicine.co.uk
Web Site: www.hyperbaric-medicine.co.uk

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