



# Hyperbaric Oxygen Safety Considerations: Disinfection of Hyperbaric Facilities and COVID-19 Risk Mitigation Strategies

## WEDNESDAY, JUNE 9, 2021

Hear from the foremost Medical and Technical leaders in Hyperbaric Safety as we discuss past and present safety considerations. This event is suitable for all disciplines, as we blend the experience of Physicians, Nurses, and technical staff to formulate a unique safety course to suit your needs.

The purpose of this course is to provide current information related to the clinical and technical safety of clinical hyperbaric oxygen therapy. This course is organized by both regular and associate members. The sessions will be of special interest to clinicians and technical staff and is provided in response to requests from the membership for a pre-course related to safety aspects of clinical hyperbaric oxygen therapy. CME and CEU will be available for this course.

<p><b>COVID hypoxemic respiratory failure: From 2Lnc to HBO<sub>2</sub>T and everything in between.</b></p> <p><b>Description:</b> Dr. Wainwright shares her unique experience of how COVID-19 patients were selected and transported to the hyperbaric chamber for treatment. Hear the patient experience and bedside observations, lessons learned and preliminary findings - from the perspective of an Intensivist who has treated COVID patients since March 2020.</p> <p><b>Bio:</b> Dr. Sandra Wainwright earned her medical degree from St. George's University School of Medicine in Grenada, West Indies. In 2000, Dr. Wainwright began her internship and residency training at Norwalk Hospital – a Yale University School of Medicine affiliate. She was asked to stay on as Chief Resident and was awarded the Samuel Floch award – presented by resident peers to the individual who most exemplified excellence and collegiality among colleagues.</p>	<p>Sandra Wainwright, MD (D)</p> 
<p><b>A survey of hyperbaric chamber cleaning practices</b></p> <p><b>Description:</b> Discuss influence of COVID-19 on chamber cleaning; Discuss wide variation in chamber cleaning</p> <p><b>Bio:</b> Pulmonary and Critical care trained with clinical and research practice in hyperbaric medicine for decades; former president UHMS; former undersea and diving medical officer, based in Salt Lake City, UT.</p>	<p>Lin Weaver, MD (D)</p> 

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### Case Studies of normal items that you wouldn't think are dangerous in a Hyperbaric Chamber but are.

**Description:** The talk will be about four normal items that a patient might use or bring with them to their hyperbaric treatments that are far more dangerous than expected

1. Synthetic/artificial hair that looks and feels like normal hair
2. Pens that have a lighter on them
3. Canes that have a Taser on the end
4. Leave in shampoos and conditioners

Patient safety is of the utmost importance when receiving a hyperbaric oxygen treatment. Proper education of the hyperbaric patient is key in providing a safe treatment along with proper clearing of the patient prior to starting the treatment. In this lecture, I want to provide to the audience information on how to succeed in providing safe treatments and some examples of items that have been found at Duke that appear harmless but are far from it!

**Bio:** I have worked in the Duke University Health System as an RN for over 30 years. I have worked as a Hyperbaric Nurse for 25 years, and have been in a supervisory position for 18 years. I am currently the Baromedical Nurses Association (BNA) President and have served on the BNA Executive Board. I am also a member of the UHMS Safety Committee. I have had my ACHRN certification for 14 years. I have been a key presenter for multiple lectures for the BNA and have presented at the ASM on multiple occasions.

Kevin Kraft, RN, BSN, ACHRN, CNML (D)



### Distractions and complacency and their impact on safety.

**Description:** Human factors and their impact on safety. We are all subject to our biases and our inability to know what we don't know. These contribute to increasing the risk of an adverse event in the hyperbaric and diving environment. This lecture will provide information of recognition of these inherent behavioral and psychological factors so that they may be addressed.

1. Introduce attendees to the concept of human factors that affect safety in the hyperbaric environment.
2. Provide the attendee with a basic understanding of the bias and behavior that adversely affects patient and staff well-being during hyperbaric operations.

**Bio:** Over 50 years' experience in clinical, supervisory, teaching, staff and middle management positions in acute care hospitals. This experience includes 40 years as a Respiratory Therapist, 20 years as EMT-I, 23 years as a Naval Reserve Hospital Corpsman, 26 years in Hyperbaric Medicine, 18 years' experience in wound and burn care and 23 years as a Registered Nurse. Experience in hyperbaric medicine has included Technical Director, Program Director, Nurse Manager and Critical Care Educator specific to hyperbaric medicine.

Richard "Gus" Gustavson, MPH, RN, CHRN-C, CWCN, CHT-A, CRT (D)



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### **Urgent and emergent HBO2T: Operational readiness assessment and plan of care communication**

**Description:** There is a deficiency of clinical hyperbaric facilities in the United States capable of responding to the urgent and emergent conditions for which scientific and clinical evidence supports the use of hyperbaric oxygen therapy. As the hyperbaric medicine community endeavors to originate solutions to the complex problems that have contributed to this deficiency, individual facilities and the professionals that staff them can answer questions fundamental to safe and proper administration of hyperbaric oxygen therapy to acute and critically ill patients. What level of medical urgency is your facility capable of responding to? What staff and equipment resources are available to you? What is best practice for communicating a plan of care to medical or surgical services in your community that have little knowledge of your facility or the treatment you offer?

1. Define the level of medical urgency that your hyperbaric facility can respond to today.
2. Identify the staff and equipment resources necessary for safe and proper administration of HBOT to patients with urgent and emergent indications.
3. Synthesize the operational readiness assessment and communicate a plan of care that informs and establishes stakeholder expectations.

**Bio:** Nick Marosek is the Nurse Manager of the Hyperbaric and Altitude Medicine program at Mayo Clinic in Rochester, Minnesota. Nick is an Advanced Certified Hyperbaric Registered Nurse. He has fifteen years' experience in critical care nursing and nine in hyperbaric medicine. Nick loves his job and the people that he is privileged to work with.

Nicholas Marosek, CHRN, ACCRN (D)



### **Hyperbaric chamber disinfection: Determining effective suitable products and methods for COVID infection control.**

**Description:** Determining a suitable and effective disinfectant is more than just conferring with the EPA List N or reviewing the product SDS. Suitability with hyperbaric chamber material - including acrylic windows, human safety in confined environments, application requirements and regional availability are some of the other equally important decision-making criteria.

**Bio:** Francois Burman BSc (Engineering), International PE, MSc (Medical Sciences) Francois is the Director of Risk Mitigation at the Divers Alert Network. He is primarily responsible for all safety and accident prevention initiatives, aimed at making diving safer. The recompression chamber network is also his responsibility and he has travel across the world doing safety assessments at facilities used to treat injured divers. He has written a series of books and papers specifically aimed at the hyperbaric and diving industry, and regularly presents lectures on safety in this field. Francois serves on a range of hyperbaric industry committees, including the UHMS Safety Committee and ISO, ASME-PVHO and NFPA standards committees.

Francois Burman, Pr Eng, BSc (Eng), MSc (D)



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### Disinfection of medical hyperbaric chambers - review of standards and options

**Description:** The general aspects of disinfection of the hyperbaric chamber with the special attention for cleaning the chamber after the COVID patient will be presented. Different approaches will be compared with each other concerning both mono- and multiplace chambers. Standards from different countries and organizations will be presented and discussed.

#### Bio Dr. Kot:

Dr. Jacek Kot is a specialist in anesthesiology and intensive care and currently he is full time Associate Professor in Diving and Hyperbaric Medicine at Medical University of Gdansk, Poland serving also as the Chief of Research and Development of the National Centre for Hyperbaric Medicine in Gdynia, Poland. The Centre is equipped with several multiplace hyperbaric chambers, a dry saturation simulator with a 'wet pot', as well as the 6-bed Intensive Care Unit within the University Hospital. Jacek Kot is the present President of the European Committee for Hyperbaric Medicine (ECHM), and from 2015 till 2018 he was the President of the European Underwater and Baromedical Society (EUBS). He has been involved in the international cooperation between European diving and hyperbaric centres (COST-B14, OXYNET, PHYPODE, DAN), as well as in the UHMS International Web-based Education Initiative. His professional interests include mainly HBOT in deep dives and saturation decompressions, as well as critically ill patients, especially with severe soft tissue infections.

Jacek Kot, MD, PhD



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### Maintaining accreditation and safety through 2020 challenges

**Description:** Experiences of the UHMS Facility Accreditation Surveyors who continued the Accreditation Program in the face of an unprecedented pandemic.

We plan to share a little history of the accreditation program, how the COVID-19 Pandemic stopped most businesses, transitions in UHMS Accreditation preparations and surveyor team selection, and discuss how the future survey preparations/administration and team selections will be made.

1. To discuss Accreditation Survey Process, share struggles and changes needed for successful Accreditations in 2020 and transitions for future surveys
2. Discuss the challenges we incurred during the pandemic, and the transitions needed to submit a successful program during the tight restrictions on visitors/surveyors arriving from out of state.

**Bio Derall:** Current Hyperbaric Facility Accreditation Director for the UHMS Mr. Garrett has been working in the industry for over 20 years working with both multiplace and monoplace chambers in freestanding clinics and hospital-based centers. He is a graduate of the College of Oceaneering with a degree as a Commercial Diver with further specialization as a Diver Medic. He has also has been certified by the National Board of Diving Hyperbaric Technologist as Hyperbaric Technician since 2000. Mr. Garrett is factory trained in both ETC and Perry Chambers. His areas of training include maintenance and repair for the ETC XD and Select monoplace chamber models and all Perry Sigma models. Mr. Garrett has provided maintenance and repair services in the United States and for several companies overseas. When he was the Vice President of Hyperbaric Services for Innovative Healing Systems from 2006 – 2012, Mr. Garrett also helped conduct training programs for hyperbaric technicians and safety directors. He has written policy and procedures for the company, as well as, a part of many starting up programs for hyperbaric and wound care centers in the United States as well as in India and Dubai. He was involved in the planning, construction, and finishing stages of getting the facility operational. Mr. Garrett has also participated in several UHMS survey teams as a UHMS accreditation surveyor for both monoplace and multiplace facilities since 2013. He has been a member since 2003 of the Undersea and Hyperbaric Medical Society.

**Bio Monica:**

UHMS Accreditation Nurse Surveyor since 2001, Retired CHRNC and Air Force Nurse.

Derall Garrett, CHT (D)

Monica Skarban, RN (D)





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### Acrylic shell viewport rupture - A review of the accident in Bogotá

**Description:** A review of the information released to date on the incident occurring on February 4th, 2021 where an acrylic shell viewport ruptured at the Soring Clinic in Bogotá, Colombia.

1. Review the facts of the incident as we know them today in SBAR format
2. Recognize different methods used in the manufacturing of acrylic cylinders
3. Briefly cover the importance of compliance to codes and standards

**Bio:** Andrew's combined military and civilian experience in Hyperbaric Medicine spans 23 years. He is the Technical and Safety Director of the Hyperbaric and Altitude Medicine Program at the Mayo Clinic. He is also a UHMS member and serves as the chair of the UHMS safety committee. Andrew's professional interests lie in education, emergency preparedness, and advancing the practical use of Hyperbaric Oxygen Therapy.

Andrew Melnychenko, CHT (D)



### Risk mitigation of COVID transmission for hyperbaric work in support of diving and tunneling operations.

**Description:** A look at some of the operational considerations and policy amendments imposed by COVID safe work plans. We will take a look from a company perspective in both meeting the clients needs while balancing worker safety with examples of some SOP's developed by international tunneling and diving companies. We will also learn about the impact to the divers and compressed air workers themselves and the sacrifices made in order to perform their work in a confined space where standard measures to avoid the spread of infection can not take place.

1. Understand the considerations and changes required for a COVID safe work plan.
2. Balancing industry needs and worker safety considerations.
3. Show examples from industry of the company procedures in action.

**Bio:** Director of the Environmental Medicine and Physiology Unit at Simon Fraser University, a research facility with an inland saturation, diving and altitude chamber complex with a wet pot and breathing machine capabilities. Chair of the CSA Z275.1 committee on hyperbaric environments and an Executive on the Board of Directors for CUHMA. Prior to research was a scientific diving safety officer, occupational and technical instructor and diver

Sherri Ferguson, MSc. (D)



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**Adapt and overcome: Building your team's approach to handling the unusual and unexpected.**

**Description:** *At some time in your career something unusual and unexpected will come through the doors of your hyperbaric medicine unit that is beyond your personal scope of experience. Examples are:*

*Mass casualties,*

*New or unusual patient medical devices*

*Dealing with equipment approaching obsolescence*

*Onboarding new devices and determining suitability in the hyperbaric environment*

*Staffing challenges*

*COVID-19 considerations for your unit, and how to keep staff and patients safe while continuing to operate*

*Dealing with patient transport, admission to appropriate level of care and other logistical considerations*

*This talk will hopefully help you get beyond the "deer in the headlights" phase and give examples of how our unit has approached some of these issues using teamwork and a systematic method. There is not always a pathway to "yes, I can treat this patient in my chamber" and there does not have to be. Not all hyperbaric units are able to even consider some of these challenges. By objectively assessing resources, training, and risk/benefit, though, the answer does not always have to be "no."*

**Bio:** Dr. Gary N. Toups is board certified in Family Medicine (ABFM), Aerospace Medicine (ABPM) and in Undersea and Hyperbaric Medicine (ABPM). He is currently the Medical Director of the Hyperbaric and Altitude Medicine Unit in Rochester, Minnesota. Before he attended medical school, Dr. Toups had a career as a US Air Force aviator. He earned aeronautical ratings as both Navigator and Pilot, flying the F-111D and B-52 G/H aircraft. He trained as a USAF Flight Safety Officer and has extensive experience in aircraft accident investigation. He earned his MD at LSU Health Sciences Center School of Medicine in New Orleans (1995 – 1999) and completed his Family Practice residency training at University Medical Center in Lafayette, LA (1999-2002). He re-entered the United States Air Force and served as a physician 2002–2014). He specialized in hyperbaric medicine after completing the USAFSAM Fellowship in Undersea & Hyperbaric Medicine in 2008. He retired from the USAF in 2014, and moved to Minnesota to join the staff at the Mayo Clinic. Dr. Toups began his association with hyperbaric medicine during his first assignment to Kadena Air Base, Okinawa, Japan (2004 – 2007). As a flight surgeon, he treated many cases of diving and altitude-related DCS in the base hyperbaric chamber. Dr. Toups is a PADI Open Water Dive Instructor and a technical diver. He volunteers with Olmsted County Sheriff's Dept Dive Recovery Team as a public safety diver.

Gary Toups, MD (D)

