

UNDERSEA AND HYPERBARIC MEDICAL SOCIETY

A nighttime photograph of Disney's Coronado Springs Resort. The resort's lights are reflected in a body of water in the foreground. The sky is dark blue with some clouds. The resort's architecture is visible, including a large domed building and several palm trees.

Annual Scientific Meeting

June 28-30, 2018

Pre-courses: June 27

"Raising the Quality of Practice One Member at a Time"



Education is key...

The UHMS Annual Scientific Meeting's primary goal is to provide a forum for professional scientific growth and development of the participants to improve knowledge and competence in order to further patient outcome. The meeting provides a basis for exchange of ideas, both scientific and practical, among physicians, researchers, and other health care professionals.

Destination is key...

At the end of the day, meeting attendees want to relax, recharge and be entertained. And Orlando serves up the excitement. Options include fine dining. Thriving cultural and entertainment scenes. National and indie music acts. Engaging shows. And amazing evening events at parks like Walt Disney World® Resort. Our host hotel will be Disney's Coronado Springs Resort, Lake Buena Vista, Florida. Relive the romance of Spanish Colonial Mexico at this enchanting Resort hotel. Find your mythical city of gold in a Southwestern-themed haven—from brightly colored casitas to rustic ranchos. Each unique accommodation provides its own unforgettable escape... and a welcoming home away from home.

As a result of having attended the meeting, the participants should have had the opportunity to:

- Meet and interact with other scientists and medical practitioners: specifically, participants should have had the opportunity to renew old acquaintances and establish new contacts with basic and applied scientists and medical practitioners in hyperbaric and diving medicine as well as in the fields ancillary to hyperbaric medicine: nursing, allied health sciences, engineering, and administration;
- attend oral or poster presentations in which ideas and data are presented pertaining to currently accepted uses of hyperbaric oxygen and diving medicine and, where applicable, incorporate these ideas into their practice;
- gain a more in-depth knowledge and appreciation of scientific issues involved in critiquing decompression schedules and/or in developing safer decompression schedules;
- gain a more in-depth knowledge of current issues pertaining to the physiology and pathophysiology of compression and decompression phenomena and, where applicable, be able to apply this information in their practice;
- gain a more in-depth knowledge of the physiologic, pharmacologic, pathologic, and biochemical effects of oxygen, nitrogen, carbon dioxide, the noble gases, especially in the hyperbaric environment, on different levels of biological organization and, where applicable, be able to incorporate this information into their practice;
- gain a more in-depth knowledge of the current status of treating toxic and anoxic disorders, especially carbon monoxide poisoning, with hyperbaric oxygen and, where applicable, be able to incorporate this knowledge into their practice;
- gain new knowledge about the future scientific and medical directions of hyperbaric medicine and, where applicable, be able to incorporate the appropriate information into their practice to further improve patient outcomes;
- present material pertaining to their experiences within the diverse field of high-pressure biology and to receive critical reviews of their work;
- be introduced to new diagnostic, research, or therapeutic techniques and equipment pertaining to hyperbaric medicine and be able to incorporate the relevant knowledge and procedures into their practice;
- meet some of the past leaders of the Society and to discuss with them matters of scientific or clinical interest or matters of policy pertaining to the field or the Society;
- learn of the varied activities of the Society and the past and future directions of the Society;
- become active in Societal affairs so they could influence the Society's future.

CONTINUING EDUCATION

Accreditation Statement: The Undersea and Hyperbaric Medical Society is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Designation Statements: The Undersea and Hyperbaric Medical Society designates this live activity for a maximum of **21 AMA PRA Category 1 Credit(s)™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Nursing CEU is approved by the Florida Board of Registered Nursing Provider #50-10881. ASM Credit hours **21**. Licenses Types Approved:

- Advanced Registered Nurse Practitioner
- Clinical Nurse Specialist
- Licensed Practical Nurse
- Registered Nurse
- Certified Nursing Assistant
- Respiratory Care Practitioner Critical Care
- Respiratory Care Practitioner Non-Critical Care
- Registered Respiratory Therapist
- Certified Respiratory Therapist

NBDHMT: This live activity is approved for **21** Category A credit hours by National Board of Diving and Hyperbaric Medical Technology, 9 Medical Park, Suite 330, Columbia, South Carolina 29203.

Full Disclosure Statement: All faculty members and planners participating in continuing medical education activities sponsored by Undersea and Hyperbaric Medical Society are expected to disclose to the participants any relevant financial relationships with commercial interests. Full disclosure of faculty and planner relevant financial relationships will be made at the activity.

Disclaimer: The information provided at this CME activity is for Continuing Medical Education purposes only. The lecture content, statements or opinions expressed however, do not necessarily represent those of the Undersea and Hyperbaric Medical Society

MAINTENANCE OF CERTIFICATION

(MOC): "MOC ABPM: This activity has been approved by the American Board of Preventive Medicine for up to **21** MOC credits. Claiming ABPM MOC credit is appropriate for those who are ABPM diplomates."

FEATURED KEYNOTES

**CHRISTIAN J. LAMBERTSEN, MD, DSc
(Hon) MEMORIAL LECTURE**
THURSDAY, JUNE 28: 1:00 pm - 2:00 pm
GUEST SPEAKER: Keith Van Meter, MD
LECTURE TITLE: "A long shot to a short shot: Hyperbaric oxygen augmented ACLS/ATLS spawned by commercial diving medicine experience"



The presentation will focus on observations gleaned from a forty-year history of responding to accidents on oil rigs and diving platforms in the Gulf of Mexico to care for seriously injured commercial divers. This experience afforded a look into the advantage of immediate use of high surface equivalent fraction of inhaled oxygen (SEFIO₂) applied in short, intermittent breathing periods in the hyperbaric environment. Divers suffering from exsanguination, cardiopulmonary arrest, crush injury and severe heat shock have been successfully treated coincidentally because of requisite hyperbaric oxygen administration during surface or saturation decompression.

The favorable patient outcomes have been replicated in published animal experiments. In part, the physiological explanation might be better understood by looking into the role of mitochondria in shock. The hyperbaric chamber may be a virtual drawer of a code cart in future emergency medical systems and hospitals to improve outcomes from ACLS and ATLS.

ERIC P. KINDWALL MEMORIAL LECTURE

FRIDAY, JUNE 29: 1:00 pm - 2:00 pm
GUEST SPEAKER: Eugene Worth, MD
LECTURE TITLE: "HBOT and diabetic foot ulcers: Do we have a leg to stand on?"



Use of hyperbaric oxygen as a means of therapy for the terrible complications of diabetes began in 1979 (Hart and Strauss). There have been at least 9 randomized controlled trials, of which 7 showed beneficial effects of hyperbaric oxygen as an adjunctive therapy combined with advanced wound care. Recently, there have been 3 negative studies (Margolis, et al; Fedorko, et al; and Santema, et al.) All three of these studies have been published in the same journal, Diabetes Care. (I wonder if that is by coincidence.)

In this presentation, I will trace the history of HBOT and DFU. One of the overarching weaknesses in all of the trials is a simple fact: None of us practice 'standard wound care' or 'advanced wound care' in the same way. We can do a better job, and in today's regulatory environment, we must improve.

Finally, I will review papers disproving some regulatory fallacies. HBOT and DFU is cost-effective in a community limb salvage protocol. Hemoglobin A_{1c} (HbA_{1c}) has little or no bearing on whether a DFU will heal. Tight HbA_{1c} control may lead to premature death from hypoglycemic episodes.

My goal for each DFU is to leave the patient with an ambulatory extremity. Failure to do that hastens morbidity and mortality. In summary, fasten your seatbelt. I will challenge current paradigms and lay out a pathway to improve patient care. Yes, we have a leg to stand on!

SCHEDULE

WEDNESDAY, JUNE 27: 8AM-5PM
PRE-COURSES

Mapping a course through the Reimbursement Quagmire Pre-course

The purpose of this course is to provide current information related to new changes in coding, billing and documentation for reimbursement in the new MACRA regulatory ERA. 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 post-course related to new reimbursement issues related to clinical hyperbaric oxygen therapy. MOC/CME and CEU will be available for this course.

Differential Diagnosis of Decompression Illness Pre-course

Decompression illness (DCI) is a diagnosis assigned to a variety of acute conditions where the suspected cause is occurrence of free gas in circulation and tissues, caused by decompression. Individual manifestations are not specific for DCI, but a time proximity to decompression and some patterns of manifestations suffice to establish diagnosis in most cases. Early recognition of DCI and administration of hyperbaric oxygen (HBO₂) is important for successful treatment. However, some serious post-decompression manifestations may be coincidental and if mistaken for DCI, precious time to provide proper treatment may be lost, for example in a case of stroke.

Current practice in evaluation of acute post-dive conditions vary from taking medical history and physical examination (H&P) only, to a routine extensive testing for possible coincidental conditions. Booth approaches can sometimes result with misdiagnosis and lost treatment opportunity. Additional diagnostic tests including blood tests and imaging have been discussed quite extensively in recent years but there is no clear guidelines has been provided yet.

The aim of this workshop is to review most common coincidental post-decompression conditions that could be confused for DCI and discussion of when and what additional testing is needed to avoid misdiagnosis. The topics will include serous neurological conditions, neurological conditions resistant to HBO₂ treatment, serious cardiorespiratory conditions, post-dive abdominal discomfort, cutaneous manifestations, and osteo-muscular aches and pains.

How to Prepare for Accreditation Pre-course

The purpose of this course is to provide an overview of the UHMS Clinical Hyperbaric Facility Accreditation Program, its structure, survey processes and "insider tips" on preparing to undergo an accreditation survey. Experienced surveyor faculty members will provide a comprehensive overview of the process to streamline preparation.

WELCOME RECEPTION: 1900-2100

"Raising the Quality of Practice One Member at a Time"



SCHEDULE

THURSDAY, JUNE 28: 8AM-5PM
GENERAL SESSION

President & Executive Director Address: 0800-0830

The President and the Executive Director will speak on the activities and accomplishments of 2017, what's new for 2018 and the future of the Society.

HYPERBARIC MEDICINE AND CANCER PLENARY: 0830-1000

0830-0915: "The role of hyperbaric medicine in cancer therapy" - John Feldmeier, DO



At the same time, other researchers have advocated hyperbaric oxygen as a primary treatment for malignant conditions, though the support is limited here. A number of studies done in the late 1950s through the 1970s even on review many years later firmly establish simultaneous hyperbaric oxygen as a radiosensitizer. There are reasons to believe that sequential hyperbaric oxygen followed immediately by can enhance cancer cell kill. The pioneering work by several Japanese authors have reported encouraging results in applying this combined treatment in high-grade brain tumors. More recently, a similar study supported in part by the Baromedical Research Foundation has shown the feasibility of applying these principles to head and neck cancers receiving both chemotherapy and radiation therapy with impressive results and no unexpected toxicities.

There is a strong rationale and a bit of research that also suggest that chemotherapy's antitumor effects can be enhanced by hyperbaric oxygen as well. Certainly, the logistics of delivering chemotherapy in the hyperbaric chamber are much easier than delivering radiation with HBO₂.

In this session, Dr. John Feldmeier will introduce an overview of the above issues. These will include a discussion of the Warburg effect and its implications for combined HBO₂ and chemotherapy and HBO₂ combined with the ketogenic diet. A brief update will be presented on the status of HBO₂ alone and how it effects malignant growth. Other mechanisms by which chemotherapy delivery and tumoricidal effects can likely be enhanced will be considered.

Mr. Richard Clarke will follow with a lecture updating the experience in a multi-center trial using sequential HBO₂ and radiation with chemotherapy in advanced head and neck cancer patients.

0915-1000: "Hyperbaric Oxygen Radiation Sensitization of Squamous Cell Carcinomas of the Oropharynx" - Dick Clarke, CHT



This presentation summarizes the first study of hyperbaric oxygen chemo-radiation sensitization for locally advanced squamous cell carcinomas of the oropharynx. It took the form of a Stage I dose escalation trial, designed to determine safety, feasibility and tolerability when hyperbaric oxygen was added to standard care, namely intensity modulated radiation therapy and cisplatin chemotherapy. The presentation will describe the biological plausibility and physiologic basis for pre-radiation hyperbaric hyperoxia, and the rationale for selection of this tumor type and tumor grade. The hyperbaric dosing regimen, one based upon previous human tumor oxygen response curves, is discussed, and the critical time window for radiation therapy "beam on" from exiting the chamber discussed.

Evolution from earlier sensitization studies that employed concurrent hyperbaric oxygen-radiation therapy to the modern sequential approach are described, as will its inherent advantages. A staging protocol employed to titrate hyperbaric dose against possible acute toxicities is described. Acute toxicities and five-year follow-up results are presented, as is a Stage III study design, in the form of a randomized, sham controlled clinical double-blind trial.

Session A: Diving / Decompression Illness: Theory & Mechanisms: 1030-1130

Session A: Posters: 1130-1200

Selected abstracts on the related topic will be presented orally during the 1030-1130 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1130-1200 time slot.

Lambertsen Keynote: 1300-1400: "A long shot to a short shot: Hyperbaric oxygen augmented ACLS/ATLS spawned by commercial diving medicine experience" - Keith Van Meter, MD: Lecture information on page 3.

Session B: Diving / Decompression Illness: Theory & Mechanisms: 1400-1500

Session B: Posters: 1530-1600

Selected abstracts on the related topic will be presented orally during the 1030-1130 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1530-1600 time slot.

CALL FOR ABSTRACTS

On behalf of the Undersea and Hyperbaric Medical Society, the UHMS Program Committee is pleased to announce its call for abstract submission to the 2018 UHMS Annual Scientific Meeting.

Abstracts should be submitted via the UHMS website at www.uhms.org. For those unable to access the UHMS website or having difficulty with the online submission format, additional assistance with the submission process can be obtained by contacting the UHMS home office. Authors should ensure that all submission requirements are met, as incomplete submissions may be returned for modification or declined. Acknowledgment of receipt will be provided normally within one week.

TERMS AND CONDITIONS:

Abstract acceptance is at the full discretion of the UHMS Annual Scientific Program Committee. **Only non-published works at the time of abstract submission will be considered, however, novel analysis/interpretation of published data are acceptable.** Notification regarding abstract final acceptance will be provided via e-mail no later than April 24, 2018. **The presenting author will be required to register and attend the meeting.**

UHMS is will continue using digital poster presentations in lieu of the traditional cork board and printed posters. All abstracts which have been approved and accepted will be presented in PPT or PDF format and uploaded to the UHMS Poster website. Instructions for upload, FAQ and templates for poster presentations will be emailed to the presenting author upon acceptance. This information can be found at the following link, under the "Call for Abstract" section. <https://www.uhms.org/asm-new>

Also at the discretion of the UHMS ASM Program Committee, presenters may be invited to present their abstract orally in the general meeting, resident/trainee competition (if eligible) or the Associates session (if eligible). Notification regarding selection for oral and poster presentations will be provided no later than Monday, April 23, 2018.

ABSTRACT USE PERMISSIONS AND RIGHTS:

All abstracts submissions for presentation at the Annual Scientific Meeting constitutes consent by the author(s) for the UHMS to use the materials submitted in whole or part as it sees fit. All abstracts posters (including required PowerPoint/PDF submissions) and oral presentations (including PowerPoint slides) accepted by the UHMS Program Committee for presentation at the Annual Scientific Meeting will be published in the UHMS' *Undersea and Hyperbaric Medicine* Journal and may be subsequently used and/or published by the Society in various electronic media at the discretion of the UHMS. Once accepted, no abstract, poster or oral presentation may be withdrawn or excluded from being subject to this agreement.

Deadline for submission: April 2nd

"Raising the Quality of Practice One Member at a Time"

THINGS TO DO

Theme Parks: Find out what's new and exciting at Walt Disney World® Resort, Universal Orlando® Resort, and SeaWorld Parks & Entertainment.

Attractions: From rockets to acrobats, Orlando's attractions will make your experience even better.

Dining: Orlando is a true culinary hot spot with award-winning restaurants, celebrity chefs and chic wine bars for just about any taste.

Nightlife & Entertainment: From trendy outdoor lounges to live venues, Orlando provides attendees with nearly unlimited entertainment options.

Golf: Orlando's world-class golf courses, top-ranked instructors and luxurious resorts cater to the most discerning golf enthusiasts.

Shopping: When it comes to shopping, Orlando has deep closets. While we can certainly bring out the glitz, we also know a great deal when we see one.

Spas: Many of Orlando's destination spas are conveniently located at convention hotels, making the temptation nearly impossible to resist.

Arts, Culture & History: The same spirit of creativity that helped develop Orlando's famed theme parks has also produced a thriving arts and culture scene.

Sports, Recreation & Outdoors: With more than 300 days of sunshine each year, every day is a perfect opportunity to get outside and explore Orlando.

<http://www.orlandomeeting.com/things-to-do-in-orlando/>



SCHEDULE

MECHANISMS OF HBO PLENARY: 1600-1700

"Hyperbaric Oxygen Therapy Cell Signaling & Mechanisms of Action" - Stephen Thom, MD



This lecture will summarize current knowledge on mechanisms of action for hyperbaric oxygen (HBO₂) therapy. Information will include findings from peer-reviewed publications involving both animal and human studies. It will emphasize data from human investigations, with a focus on those actions most relevant to clinical HBO₂ indications.

EXHIBITOR WINE & CHEESE RECEPTION: 1800-1900

FRIDAY, JUNE 29: 8AM-5PM

GENERAL SESSION

RESEARCH AND REGISTRIES FOR HYPERBARIC OXYGEN THERAPY PLENARY:

0800-1000

0800-0830: "The Hyperbaric Oxygen Therapy Registry and the role of a Qualified Clinical Data Registry in protecting reimbursement" - Caroline Fife, MD



The field of hyperbaric oxygen therapy and hyperbaric practitioners are under unprecedented scrutiny with a resulting 50% decrease in HBO₂ utilization nationally. Most practitioners are now subject to The Merit Based Incentive Payment System (MIPS) which requires the submission of quality measures. Qualified Clinical Data Registries (QCDRs) can develop specialty specific quality measures and transmit data to CMS on behalf of clinicians, increasing the opportunity for bonus payments. The HBOTR, through the USWR, offers specialty registry participation as part of MIPS. Registry participation is possible via automated transmission of Continuity of Care Documents (CCDs) which can enable national benchmarking of many key parameters and can address patient selection bias for other types of registry participation by providing a "denominator" for patients/conditions treated. QCDRs manage identified data and can link to the Medicare data warehouse, facilitating HBO₂ cost effectiveness research. Patient reported questionnaires can be enshrined as quality measures enabling practitioners to realize a small reimbursement benefit for performing them. Provider scores on specialty specific quality measures are publicly available via the USWR website linked to "Physician Compare," a welcome alternative to star ratings derived only from standard (and irrelevant) MIPS measures. Hyperbaric Centers may also benefit from quality measure reporting. The HBOTR leverages current mandatory reporting requirements and available electronic health record technology to automate registry participation, an important consideration given the lack of funding for HBO₂ research. The HBOTR has already saved physician payment from a substantial reduction and can be harnessed for clinical research. Since January 2012, data on 27,404 patients has been captured. Among the 62,843 DFUs with data, 9,908 DFUs (15.7%) were treated with HBO₂ therapy, although in 2017, the benchmark rate for HBO₂ was 7.3%, with an average of 28 treatments per patient. There are 2,100 providers who report data to the USWR by transmitting CCDs from their EHR and 688 who submit quality measure data, 300 (43.6%) of whom transmit HBO₂ quality measure data.

0830-0900: "The hyperbaric medicine registry at Dartmouth" - Jay Buckley, MD



The value of hyperbaric oxygen is being questioned even for well-established UHMS-approved indications. Although every hyperbaric center treats cases for established indications, the outcomes are not gathered together at a central site, analyzed, and published. As a result, outcome data for hyperbaric oxygen are limited and hard to find. An outcomes registry collects outcomes data from multiple sites consistently, which could allow for more powerful analyses, and more widely accessible results. This talk will describe the outcomes-focused hyperbaric registry currently in use at Dartmouth, and how it could be used to advance the field of hyperbaric medicine.

0900-0930: "The role of registries in medicine" - Judy Rees, MD, PhD



The goal of a disease or treatment registry is to document important data systematically from a sample of patients and use it to make inferences to a larger population. This presentation will consider how registries can be used, some of the pitfalls awaiting the unsuspecting registry researcher; and approaches that will give the best chance of success.

0930-1000: "Panel Discussion"

"Raising the Quality of Practice One Member at a Time"

DISNEY'S CORONADO SPRINGS RESORT

1000 West Buena Vista Drive
Lake Buena Vista, Florida 32830-8403
Phone: (407) 939-1000

ROOM RATE: \$152* S/D

ROOM RESERVATIONS:

"The Society has negotiated a special discounted room rate (room-block) with the hotel. Your patronage of this meeting hotel makes it possible for the Society to secure the space necessary for this event at a greatly reduced cost. The hotel not only offers a discounted rate and the best networking opportunities, but staying in the group block helps the Society meet its obligation to the hotel, avoid penalties, and keep meeting registration prices down. Any attendee that does not book under the UHMS room block, will not receive the special discounted amenities."

Online Booking Website:

[https://aws.passkey.com/
event/49275786/owner/70576/home](https://aws.passkey.com/event/49275786/owner/70576/home)

Call-in: 407-939-4686

for assistance. Office hours are Mon-
day thru Friday 8:30 AM to 6:00 PM EST.
Saturday and Sunday 8:30 AM to 5:00
PM EST

ROOM RESERVATIONS CUT-OFF

DATE: JUNE 2, 2018: 5pm ET

*ROOM RATE: \$152 S/D per room, per
night, plus sales & resort taxes, cur-
rently 12.5% - Subject to availability of
group rate rooms, run of house Hotel
rooms may be reserved at the Group Room
Rates for the three days before Saturday,
June 23, 2018 and the three days after
Sunday, July 1, 2018 for attendees wishing
to extend their stays.



SCHEDULE

Session C: Diving & Decompression Illness 1030-1130

Session C: Posters: 1130-1200

Selected abstracts on the related topic will be presented orally during the 1030-1130 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1130-1200 time slot.

Kindwall Keynote: 1300-1400: "HBOT and diabetic foot ulcers: Do we have a leg to stand on?" - Eugene Worth, MD: Lecture information on page 3.

Session D: Clinical HBO₂ Therapy: 1400-1500

Session D: Posters: 1530-1600

Selected abstracts on the related topic will be presented orally during the 1400-1500 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1530-1600 time slot.

HBO₂ AND DFU PLENARY: 1600-1700

1600-1630: "The effectiveness and costs of hyperbaric oxygen therapy for diabetic ischemic ulcers: results of the DAMOCLES multicenter trial" - Dirk Ubbink, MD

This trial was conducted in 9 hyperbaric centers and 25 referring hospitals to find out whether additional HBOT would benefit patients with diabetes and ischemic leg ulcers. We randomized 120 diabetic patients with an ischemic wound to standard care without (SC) or with HBOT (SC+HBOT). Primary outcomes were limb salvage and wound healing, amputation-free survival (AFS), and direct and indirect medical costs.

Limb salvage was achieved in 47 patients in the SC group vs. 53 patients in the SC+HBOT group. After 12 months, 28 index wounds were healed in the SC group vs. 30 in the SC+HBOT group. AFS was achieved in 41 patients in the SC group and 49 patients in the SC+HBOT group. In the SC+HBOT group 21 patients (35%) were unable to complete the HBOT-protocol as planned. Those who did had significantly less major amputations and higher AFS. Overall costs were slightly higher in the SC+HBOT-group.

1630-1700: "The Long Beach Wound Score as a Validated Tool for Comparative Effectiveness Research of Wounds and Objectifying the Indications for Hyperbaric Oxygen" -

Michael Strauss, MD

The Long Beach Wound Score (LBWS) is a validated wound scoring system that is user friendly, intuitively obvious and applicable for all wounds and not just diabetic foot ulcers. Five assessments each graded from 2-points (best possible) to 0-points using objective criteria to grade each are summated to generate 0 to 10-point scores.

The scores then quantify three wound categories; "Healthy" 7.5 to 10 points, "Problem" 3.5 to 7 points and "End-stage" 0 to 3 points. The assessments include 1) Appearance of the wound base, 2) Size--including undermining, 3) Depth--to wound base or bottom of a tract, 4) Infection and 5) Perfusion.

For wounds in the "Healthy" category only simple wound care and occasionally biologics are needed for management. Deep infection, deformity, and/or ischemia are invariable present in the "Problem" wound category. These require debridements and antibiotics plus revascularization and/or hyperbaric oxygen (HBO₂). Juxta-wound transcutaneous oxygen measurements in room air and with HBO₂ objectify when this modality is indicated for wound management. Wounds in the "End-stage" category require amputation or revascularization if salvage is indicated. The decision for amputation versus salvage in a "Transition" zone (LBWS in the 2.5 to 4 point range) require information about the patients' Wellness and Goals, both quantified by 0 to 10 scores as intuitively obvious and easy to use as the LBWS.

With 24 billion dollars a year being spent in the USA for management of chronic wounds, Comparative Effectiveness Research (CER) is needed to evaluate the effectiveness, cost benefits, and convenience of wound care. The essential consideration for CER is using a wound scoring system that objectifies the evaluation so "like can be compared with like." The LBWS is the reliable (similar scores by two or more observers) and validated tool that meets this requirement. With the LBWS the UHMS has the potential to establish a registry, document the effectiveness of interventions and become the "go to" source for payers to justify authorizations for wound management including HBO₂ treatments.

UHMS GENERAL BUSINESS MEETING: 1700-1600

"Raising the Quality of Practice One Member at a Time"

TRANSPORTATION

AIRPORT:

Orlando International Airport: MCO

TRANSPORTATION FROM THE AIRPORT TO DISNEY'S CORONADO SPRINGS RESORT:

Disney's Magical Express: Disney's Coronado Springs Resort will provide "Disney's Magical Express" service for attendees staying overnight at the Hotel who are traveling through Orlando International Airport (provided this service is offered to Hotel guests at the time of the meeting). This service will consist of complimentary airport shuttle, luggage delivery (after your attendees have gone through the Customs process, if applicable) and remote airline check-in (on participating airlines only), all subject to the terms in effect for this service at that time. For more information visit the following website: <https://disneyworld.disney.go.com/guest-services/magical-express/>

HOTEL SHUTTLES: Located on the B-Side of the Terminal, on the Ground Transportation Level (Level 1), at Commercial Lane spaces B42-B47.

RENTAL CARS: Orlando is the largest rental car market in the world, with most of the major car rental companies located on-airport, without the need for a shuttle bus to pick up your rental car. The rental car companies are located on the A-Side and B-Side of the Terminal on the Ground Transportation Level (Level 1). Orlando International Airport offers airline check-in services on level "R1" of the parking garages where rental cars are returned. The "A" Garage location is located on the west end and the "B" Garage location is on the east end (i.e. the ends nearest the entrance ramps). Visit the following website for more information: <https://orlandoairports.net/parking-transportation/rental-cars/>

SCHEDULE

SATURDAY, JUNE 30: 8AM-5PM

GENERAL SESSION

EMERGING INDICATIONS FOR HYPERBARIC OXYGEN THERAPY PLENARY:

0800-1000

0800-0830: "Hyperbaric Oxygen Therapy for Aseptic Necrosis of the Femoral Head and of the Femoral Condyle" - Enrico Camporesi, MD



Osteonecrosis of the knee (ONK) is a form of aseptic necrosis resulting from ischemia to subchondral bone tissue. Typically, common surgical treatments are invasive and palliative or time-limited. Hyperbaric oxygen (HBO₂) therapy may provide a non-invasive alternative by improving oxygenation and reperfusion of ischemic areas, both for distal femoral condyle, as recently described, or for a similar malady of the femoral head, previously published.

We recently described 37 ONK patients (29 male, 8 female; mean age ± 1 SD: 54 ± 14). 83.7% of patients presented with Aglietti stage I-II; 16.3% presented with Aglietti Stage III. Patients were treated with HBO₂ once a day, five days a week, at 2.5 ATA with 100% inspired oxygen by mask for an average of 67.9 ± 15 sessions. Magnetic resonance imaging was performed before HBO₂, within one year after completion of HBO₂, and in 14 patients, 7 years after treatment. Oxford Knee Scores (OKS), an index of functionality, where 60 is normal, were recorded before HBO₂ and at the end of each HBO₂ treatment cycle.

After the 30 sessions of HBO₂, 86% of patients experienced improvement in their OKS, 11% worsened, and 3% didn't change. All patients improved in OKS after 50 sessions. MRI evaluation 1 year after HBO₂ completion showed that edema at the femoral condyle had resolved in all but one patient. MRI at 7 year after completing therapy were all normal. In conclusion, HBO₂ is beneficial in ONK. Patients experienced improvements in pain and mobility as demonstrated by improvement in OKS. Radiographic improvements were also seen upon post treatment follow-up. Aglietti Staging for the entire sample saw an aggregate decrease ($p < 0.01$) from 1.7 ± 0.7 to 0.3 ± 0.6 .

0830-0900: "Hyperbaric pre-conditioning" - Gerardo Bosco, MD



Pre-conditioning (PC) has been described as the hyperbaric oxygen (HBO₂) experience before a critical event, with the aim to prevent a specific clinical condition, and its development as a valuable complement both in diving medicine (Bosco, 2010) as well as prior to ischemic or inflammatory situations. PC is a preventive treatment that triggers endogenous cascades, which can protect from stress-activated and stress-reactive responses. A possible mechanism of HBO-PC

mediating beneficial effects has been described as attenuation of the production of proinflammatory cytokines in response to an inflammatory stimulus such as surgery and modulation of the immune response. HBO-PC protocols are performed at 2.0–2.5 atmospheres absolute (ATA), and usually only applied for one or a few days. The physical adaptations in response to alterations in atmospheric oxygen appear to extend not only to survival, but also a preconditioned state.

Similar to ischemic and stress preconditioning, many different paradigms have been used to demonstrate that either rapid or delayed tolerance is affected by the HBO₂ therapy. Irrespective of the cause of injury, inflammatory cytokines released after the primary event trigger leukocyte activation and free radical release, causing secondary damage and extension of injury. Thus, modulating inflammatory molecules has the potential benefit of limiting leukocyte-mediated extension of injury. Many studies demonstrated a protective mechanism of HBO-PC in the injured brain, heart, or liver. Previous data by Yang and colleagues on animals demonstrated that HBO₂ inhibits TNF- α production during intestinal, brain and muscle ischemia-reperfusion and it has a beneficial effect, mediated by decreased production of IL-6, IL-1 β , dopamine and lactate (Bosco, 2007; Yang, 2001;2006;2010). Studies on animals showed that HBO-PC can protect the brain from ischemia-reperfusion injury and that Sirt1 is a potential molecular target for therapeutic approaches (Ding, 2017). In man, HBO-PC induces endogenous cardioprotection subsequent to ischemic reperfusion injury (Allen, 2014).

Additionally, clinical HBO-PC showed effects before surgery. A single preoperative hyperbaric oxygen treatment on the day before surgery may reduce the complication rate in pancreatic resection (Bosco, 2014). In liver surgery, studies demonstrated to increase the number of new cells and the density of microcirculation in the regenerating liver after HBO-PC (Theodoraki, 2011). Furthermore, hyperbaric oxygen preconditioning improves postoperative dysfunctions by reducing oxidant stress and inflammation (Gao, 2017). A recent experimental paper has identified an important mechanism involved in triggering the beneficial effect of HBO-PC, as the intracellular induction of heme-oxygenase-1 in hepatic IR injury. Moreover, in dive medicine HBO-PC reduced bubble formation and platelets activation; HBO-PC might enhance lymphocyte antioxidant activity and reduce reactive oxygen species levels. Pre-breathing oxygen in water may also preserve calcium homeostasis, suggesting a protective role in the physiological lymphocyte cell functions (Bosco, 2010; Morabito, 2011).

"Raising the Quality of Practice One Member at a Time"

REGISTRATION FEES

Wednesday, June 27

- Pre-courses: \$180

Thursday – Saturday, June 28-30

- Member: Physician or Equivalent:
Three days: \$795; Daily Rates: Fri: \$285 / Sat: \$285 / Sun: \$285
- Member: Fellow/Resident/Non-physician/Student:
Three days: \$595.00; Daily Rates: Fri: \$215 / Sat: \$215 / Sun: \$215
- Non-Member: Physician or Equivalent:
Three days: \$995; Daily Rates: Fri: \$350 / Sat: \$350 / Sun: \$350
- Non-Member: Fellow/Resident/Non-physician/Student:
Three days: \$695; Daily Rates: Fri: \$240 / Sat: \$240 / Sun: \$240

Welcome Reception: Wednesday, June 27 (7-9pm):

- \$0 for registered attendee
- \$50 for Accompanying person (see special AC packages)

Exhibitor Reception: Thursday, June 28 (6-7pm)

- \$0 for registered attendee
- \$40 for Accompanying person (see special AC packages)

Banquet: Saturday, June 30 (7-10pm)

- \$50 for registered attendees \$50 for Accompany person (see special AC packages)

After party: Saturday, June 30 (10pm-12am)

- \$25 for registered attendee
- \$25 for Accompany person (see special AC packages)

SPECIAL PACKAGES FOR ACCOMPANYING PERSONS

- \$395: AP Meeting Attendance (non-medical, non CME/CEU) includes: access to meeting, Continental breakfast, coffee breaks, welcome reception & exhibitor reception
- \$245: AP Premium Package: includes: Continental breakfast, coffee breaks, welcome reception, exhibitor reception, banquet & after party
- \$160: AP Basic Package: includes: welcome reception, exhibitor reception, banquet & after party

SCHEDULE

Whether the various preconditioning protocols contribute to the different results should be investigated in further studies and applied to diverse surgical procedures, especially major surgeries leading to postoperative ICU admission. Therefore, HBO-PC is an encouraging and feasible therapeutic strategy for protecting organs from the subsequent lethal stimulus.

0900-0930: "Brain Injury" - Shai Efrati, MD



Current status and future perspective on the use of hyperbaric oxygen therapy for brain injuries

0930-1000: "Panel Discussion"

Session E: HBO₂ Therapy, Chambers, and Equipment: 1030-1130

Session E: Posters: 1130-1200

Selected abstracts on the related topic will be presented orally during the 1030-1130 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1130-1200 time slot.

NEW PEARLS OF WISDOM IN THE DIVING AND HYPERBARIC MEDICINE LITERATURE PLENARY: 1300-1400

1300-1330: "Hyperbaric medicine literature update" - Brian Keuski, MD, Fellow, Duke Hyperbarics



Take a whirlwind tour through the last 12 months of diving medicine literature. Major topics include: decompression illness, fitness to dive issues, immersion pulmonary edema, and diving physiology.

1330-1400: "Diving medicine literature update" - Lince Varughese, MD; Fellow, LSU Hyperbarics



Dr. Varughese will give a brief update on key articles in recent hyperbaric medicine literature; novel ideas and newfound wisdom.

Session F: Top Case Reports: 1400-1500

Session F: Posters: 1530-1600

Selected abstracts on the related topic will be presented orally during the 1400-1500 session. All submitted abstract on the related topic will be presented in electronic poster format during the 1530-1600 time slot.

CLINICAL AND METABOLIC ASPECTS IN BREATH-HOLD DIVING PLENARY: 1600-1700

1600-1620: "Adaptive mechanisms in breath-hold divers" - Gerardo Bosco, MD



The human body faces extreme physiological challenges while immersed with voluntary breath-holding. Breath-hold diving is potentially associated to extreme environmental factors such as increased hydrostatic pressure, hypoxia, hypercapnia, hypothermia and strenuous exercise. Physiological adaptations can depend among the time of breath suspension and the depth of diving. While descending chest squeeze and blood redistribution occur. Indeed, blood as being an incompressible fluid from peripheral circulation is shifted to the chest. The intrathoracic blood volume increases. Moreover, face immersion results in induced bradycardia, due to the diving reflex. Conversely, breath-holding at rest, out of water, induces non-significant changes in heart rate. Breath-hold swimming, even on the surface, instead causes pronounced bradycardia. During deep diving a higher O₂ consumption and a fall in alveolar and blood O₂ content was observed. Consequently, alveolar CO₂ pressure increases due to chest compression while descending.

REGISTRATION FEES

Wednesday, June 27

- Pre-courses: \$180

Thursday – Saturday, June 28-30

- Member: Physician or Equivalent:
Three days: \$795; Daily Rates: Fri: \$285 /
Sat: \$285 / Sun: \$285
- Member: Fellow/Resident/Non-physician/
Student:
Three days: \$595.00; Daily Rates: Fri: \$215 /
Sat: \$215 / Sun: \$215
- Non-Member: Physician or Equivalent:
Three days: \$995; Daily Rates: Fri: \$350 /
Sat: \$350 / Sun: \$350
- Non-Member: Fellow/Resident/Non-
physician/Student:
Three days: \$695; Daily Rates: Fri: \$240 /
Sat: \$240 / Sun: \$240

Welcome Reception: Wednesday, June 27 (7-9pm):

- \$0 for registered attendee
- \$50 for Accompanying person (see special
AC packages)

Exhibitor Reception: Thursday, June 28 (6-7pm)

- \$0 for registered attendee
- \$40 for Accompanying person (see special
AC packages)

Banquet: Saturday, June 30 (7-10pm)

- \$75 for registered attendee; \$75 for
Accompany person (see special AC
packages)

After party: Saturday, June 30 (10pm-12am)

- \$25 for registered attendee
- \$25 for Accompany person (see special AC
packages)

SPECIAL PACKAGES FOR ACCOMPANYING PERSONS

- \$395: AP Meeting Attendance (non-
medical, non CME/CEU) includes: access
to meeting, Continental breakfast, coffee
breaks, welcome reception & exhibitor
reception
- \$255: AP Premium Package: includes:
Continental breakfast, coffee breaks,
welcome reception, exhibitor reception,
banquet & after party
- \$180: AP Basic Package: includes:
welcome reception, exhibitor reception,
banquet & after party

SCHEDULE

It was supposed that the maximum reachable depth in breath-hold diving was determined by the relationship between total lung capacity and residual volume. Craig suggested a compensatory physiologic mechanism to explain why thoracic implosion does not occur and hypothesized that a certain amount of blood was diverted from the peripheral circulation into the chest. Intrathoracic pressure in such a condition represented the elastic behavior of the chest wall when exposed to high hydrostatic pressure. The increased hydrostatic pressure at depth reduces pulmonary gas volumes and consequently increases intrathoracic blood volume, with enlargement of the right heart chambers and pressures. On the contrary, the left sections of the heart do not undergo any enlargement, and do not show any sign of pressure increase. The systolic stroke volume is the consequence of Starling's law: the blood shift stretches the heart and increases the intracardiac volume. This certainly means that, although rarely exploited in nature, anaerobic metabolic reserve represents a resource for survival of the animal. The same can be said for high-altitude hypoxic environments.

Another consideration is the "graded response" to breath-hold diving in relation to the level of physiological stress and to the control by the central nervous system. The diving response is a strategic adaptation to hostile environmental conditions common to many animals but human breath-hold divers require knowledge for the safe and health of participants.

1620-1640: "Pulmonary pathophysiology in deep breath-hold diving" - Peter Lindholm, MD



Deep breath-hold diving may expose the lungs to the limits of known human physiology. We will discuss barotrauma of descent with pulmonary edema, glossopharyngeal hyperinsufflation and arterial gas embolism.

1640-1700: "Breaking news on breath-hold diving research" - Alessandro Marroni, MD



Recent data from field research on pathophysiology of breath-hold diving will be presented, with a particular focus on breath-hold diving-induced pulmonary edema, Taravana, epidemiology, mechanisms, pathogenetic hypotheses and data on genetic predisposing factors.



SAVE THE DATE

**2019 ANNUAL
SCIENTIFIC
MEETING
JUNE 27-29**

PRE-COURSES: JUNE 26



WYNDHAM GRAND
Rio Mar Puerto Rico
Golf & Beach Resort

*UNMS recommends that you not make your flight arrangements until
90-120 days before the meeting



"Raising the Quality of Practice One Member at a Time"

REGISTRATION: 2018 UHMS Annual Scientific Meeting: June 27-30

Last Name		First Name		Degree	
Address					
Add 2 (if needed)					
City/Town			State/Province		
Postal Code			Country		
Email (must have)			Daytime #		
Privacy Consent: In registering for this conference, relevant details (name/address) will be incorporated into a delegate list for the benefit of all delegates, and also may be made available to parties directly related to the conference including accommodation suppliers and sponsors.					
CONSENT TO USE CONTACT DETAILS:					
<input type="checkbox"/> YES , I consent to my details being passed on to a third party or being used for a secondary purpose.			<input type="checkbox"/> NO , I do not consent to my details being passed on to a third party or being used for a secondary purpose		

FEES	
PRE-COURSES/Workshops: Wednesday, June 27	
Mapping a Course Through the Reimbursement Quagmire	<input type="checkbox"/> \$180.00
Differential Diagnosis of Decompression Illness Pre-course	<input type="checkbox"/> \$180.00
How to Prepare for Accreditation	<input type="checkbox"/> \$180.00
UHMS MEMBER FEES	
THREE DAY FEE: June 28 – June 30	
<input type="checkbox"/> PHYSICIAN (MD/DO/MBBS or Equivalent) <input type="checkbox"/> PHD (Researcher/Scientist)	<input type="checkbox"/> \$795.00
<input type="checkbox"/> FELLOW/RESIDENT <input type="checkbox"/> NON-PHYSICIAN (CHT/CHRN/RN/RRT/DMT/PA, etc.) <input type="checkbox"/> STUDENT	<input type="checkbox"/> \$595.00
DAILY FEES: June 28 – June 30	
PHYSICIAN (MD/DO/MBBS or Equivalent) / PHD (Researcher/Scientist)	
<input type="checkbox"/> THURSDAY: JUNE 28	<input type="checkbox"/> \$285.00
<input type="checkbox"/> FRIDAY: JUNE 29	<input type="checkbox"/> \$285.00
<input type="checkbox"/> SATURDAY: June 30	<input type="checkbox"/> \$285.00
FELLOW/RESIDENT / NON-PHYSICIAN (CHT/CHRN/RN/RRT/DMT/PA, etc.) / STUDENT	
<input type="checkbox"/> THURSDAY: JUNE 28	<input type="checkbox"/> \$215.00
<input type="checkbox"/> FRIDAY: JUNE 29	<input type="checkbox"/> \$215.00
<input type="checkbox"/> SATURDAY: June 30	<input type="checkbox"/> \$215.00
NON-MEMBER FEES	
THREE DAY FEE: June 28 – June 30	
<input type="checkbox"/> PHYSICIAN (MD/DO/MBBS or Equivalent) <input type="checkbox"/> PHD (Researcher/Scientist)	<input type="checkbox"/> \$995.00
<input type="checkbox"/> FELLOW/RESIDENT <input type="checkbox"/> NON-PHYSICIAN (CHT/CHRN/RN/RRT/DMT/PA, etc.) <input type="checkbox"/> STUDENT	<input type="checkbox"/> \$695.00
DAILY FEES: June 28 – June 30	
PHYSICIAN (MD/DO/MBBS or Equivalent) / PHD (Researcher/Scientist)	
<input type="checkbox"/> THURSDAY: JUNE 28	<input type="checkbox"/> \$350.00
<input type="checkbox"/> FRIDAY: JUNE 29	<input type="checkbox"/> \$350.00
<input type="checkbox"/> SATURDAY: June 30	<input type="checkbox"/> \$350.00
FELLOW/RESIDENT / NON-PHYSICIAN (CHT/CHRN/RN/RRT/DMT/PA, etc.) / STUDENT	
<input type="checkbox"/> THURSDAY: JUNE 28	<input type="checkbox"/> \$240.00
<input type="checkbox"/> FRIDAY: JUNE 29	<input type="checkbox"/> \$240.00
<input type="checkbox"/> SATURDAY: June 30	<input type="checkbox"/> \$240.00

Social Functions (Attendees only)☐ **YES**, I will be attending the **WELCOME RECEPTION**: Wednesday, June 27 (7-9pm)☐ **YES**, I will be attending the **EXHIBITOR RECEPTION**: Thursday, June 28 (6pm-7pm)☐ **Associate Business Luncheon**: June 28 (limited spaces—please contact UHMS—For UHMS ASSOCIATES MEMBERS ONLY)

<input type="checkbox"/> BANQUET + AFTER PARTY: Registered Attendees (accompanying person fees below): Saturday, June 30 (7-10pm) After party included (10pm-12mid-night)	<input type="checkbox"/> \$100.00
---	-----------------------------------

<input type="checkbox"/> BANQUET ONLY: Registered Attendees (accompanying person fees below): Saturday, June 30	<input type="checkbox"/> \$75.00
--	----------------------------------

<input type="checkbox"/> AFTER PARTY ONLY: Registered Attendees (accompanying person fees below): Saturday, June 30 (10pm-12mid-night)	<input type="checkbox"/> \$25.00
---	----------------------------------

Accompanying Persons (per person)

NAME of Accompanying Person: (if selecting item below) _____

AP Meeting Attendance (non-medical, non CME/CEU) includes: access to meeting, Continental breakfast, coffee breaks, welcome reception & exhibitor reception	<input type="checkbox"/> \$395.00 x ____
--	--

AP Premium Package : includes: Continental breakfast, coffee breaks, welcome reception, exhibitor reception, banquet & after party	<input type="checkbox"/> \$255.00 x ____
---	--

AP Basic Package : includes: welcome reception, exhibitor reception, banquet & after party	<input type="checkbox"/> \$180.00 x ____
---	--

AP Welcome Reception : Wednesday, June 27	<input type="checkbox"/> \$ 50.00 x ____
--	--

AP Exhibitor Reception : Thursday, June 28	<input type="checkbox"/> \$ 40.00 x ____
---	--

AP Banquet + After Party : Saturday, June 30	<input type="checkbox"/> \$ 100.00 x ____
---	---

AP Banquet ONLY : Saturday, June 30	<input type="checkbox"/> \$ 75.00 x ____
--	--

AP After Party ONLY : Saturday, June 30 (10pm-12 midnight)	<input type="checkbox"/> \$ 25.00 x ____
---	--

Printed copy of the Program	<input type="checkbox"/> \$ 25.00 x ____
------------------------------------	--

TOTAL AMOUNT ENCLOSED OR TO BE CHARGED: *ALL \$\$ are USD*

\$

CANCELLATION / REFUND POLICY: \$100.00 administrative fee will be held on all cancellations before JUNE 1 – AFTER June 1: 50% of registration fee. NO REFUNDS AFTER JUNE 16.**PAYMENT INFORMATION**☐ Check/Money Order (make payable to UHMS) ☐ Visa ☐ MasterCard ☐ American Express ☐ Diners ☐ Discover

Card Number		Expiration Date		CVV Code	
Name on Card		Cardholder Signature			
Billing Address			Billing zip code		

MAIL WITH PAYMENT TO:**UHMS****631 US HIGHWAY 1, SUITE 307
NORTH PALM BEACH, FL 33408****OR FAX TO: 919-490-5149 / email: uhms@uhms.org / website: www.uhms.org****REGISTER ONLINE at: www.uhms.org**

ABOUT UHMS

The Undersea and Hyperbaric Medical Society (UHMS) was formed in 1967. It is an international nonprofit association serving some 2,000 physicians, scientists, associates and nurses from more than 50 countries in the fields of hyperbaric and dive medicine.

The UHMS is an important source of scientific and medical information pertaining to hyperbaric medicine involving hyperbaric oxygen therapy and diving through its bimonthly, peer-reviewed journal, Undersea and Hyperbaric Medicine, symposia, workshops, books and other publications.

It organizes an annual scientific meeting at different U.S. and international locations to permit review of the latest in research and treatment and to promote the highest standards of practice.

The mission of the UHMS is:

- To provide a forum for professional scientific communication among individuals and groups involved in basic and applied studies concerned with life sciences and human factors aspects of the undersea environment and hyperbaric medicine.
- To promote cooperation between the life sciences and other disciplines concerned with undersea activity, hyperbaric medicine and wound care.

- To develop and promote educational activities and other programs, which improve the scientific knowledge of matters related to undersea and hyperbaric environments and the accepted applications of hyperbaric oxygen therapy for the membership, as well as physicians and allied health professionals, divers, diver technicians and the public at large.
- To provide a source of information and support in the clinical practice of hyperbaric medicine and to stay abreast of legislative, legal, and regulatory changes in the field.
- To provide a means by which hyperbaric facility directors/owners will have an opportunity to request an accreditation survey of their facility for safety, staffing and verifying the adequacy of the professional medical application of hyperbaric therapy.



"Raising the Quality of Practice One Member at a Time"

UNDERSEA AND HYPERBARIC MEDICAL SOCIETY

631 US Highway 1, Suite 307
North Palm Beach, FL 33408

919-490-5140 | 877-533.8467 ph
919-490-5149 fax

www.uhms.org