

40 Hour Introductory Hyperbarics Course

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WHO SHOULD ATTEND:

- Physicians / Practitioners
- Nurses
- Hyperbaric Technicians - DMT / EMT
- Other Allied Health Professionals

TOPICS:

History	Anemia
Gas Laws / Math / Physics	Arterial Insufficiencies (Retinal Occlusion)
Chamber Jargon / Safety	Emergency Procedures (EP)
Clearance to dive / TM visualizing	Treatment with Basic EP
Intro to the Drug Oxygen	Arterial Insufficiencies (Wounds)
Contraindications	Treatment with Advanced EP
Adverse Reactions	Compromised Grafts and Flaps
Review Laws and Math	Crush Injury
AGE / DCS	Delayed Radiation Injury
Startup/Shutdown Checklist	Osteomyelitis
CO Poisoning	Intracranial Abscess
Clostridial Myonecrosis	Fire in the Chamber
Routine Treatment	Off-Label Indications
Necrotizing Infections	Research and Recertification
Anti-Aging Utilization Review	Hyperbaric Research
Sensorineural Hearing Loss	Weekly/Monthly/Semi-Annual/Annual Checklists
Burns	Hazardous Marine Life

TERMINAL OBJECTIVE: Participants should be able to describe the philosophies of the physics, physiology, pathophysiology and the medical aspects of compressing patients and observers within the hyperbaric environment ensuring safe treatment protocol. By the end of this course the student should be able to identify Decompression Illness as well as CMS approved indications where Hyperbaric Oxygen Therapy (HBOT) has proven useful. Additionally, the student shall determine proper course of action given a particular symptom which in turn improves overall patient outcomes and decreases the professional practice gaps identified for this activity. Students should also be able to identify the proper controlling actions for recompression chamber emergencies and discuss other illnesses which can be treated in a chamber along with protocols used for HBOT. The students will understand introduction to Oxygen as a drug as well as pharmacodynamics and pharmacokinetics along with contraindications (relative and absolute) and understanding adverse reactions.

40-hour Introductory Hyperbaric Medicine Course for Providers

Hour	Topic	Objective
1	Intro / Housekeeping	Understand the path to successful course completion Including understanding the goals of the course, identifying course materials, describing the measures of effectiveness.
1	History	Understand the history of Diving illnesses and Hyperbaric Chamber operations and discuss major historical events in hyperbaric medicine as well as explain the evolution of the UMS and UHMS
1	Gas Laws	Understand the math required for recompression chamber operation including the laws such as Dalton impact on PP, Charles, Gay Lussac (heated vessels), Henrys (gas dissolved), Ideal gas law, Boyle's law and its effect on trapped gas, be able to Calculate PPO2 in inspired gas at varying depths and percentage inspired oxygen.
1	Math	Understand the math required for recompression chamber operation including the laws such as Dalton impact on PP, Charles, Gay Lussac (heated vessels), Henrys (gas dissolved), Ideal gas law, Boyle's law and its effect on trapped gas, be able to Calculate PPO2 in inspired gas at varying depths and percentage inspired oxygen.
1	Chamber Jargon/Safety	Understand recompression chamber theory and oxygen, Air and breathing gas delivery systems. Understand chamber environmental control systems and breathing gas purity standards. Understand types of chambers. Become familiar with chamber fire safety, the fire tetrahedron and oxygen safety.
1	Practical #1 – Walk the system / draw the system	Become familiar with drawing of the recompression chamber and trace the system to which member is exposed. Learn the methods for drawing, types of valve nomenclature and symbols as well as the position of all valves and numbering of system
1	Practical #2 – Clearance to dive / TM visualizing	Become familiar with the anatomy of the ear while administering an otoscope exam on other students. Visualize the TM and learn to teach techniques for clearing ears during chamber operations. Learn the TEED scale and providing a clearance to dive H&P examination
1	Intro to the Drug Oxygen	Learn the typically dosed measures and delivery system in hyperbarics dosed including the Pharmacokinetics, Respiration, Respiratory system, Alveoli diffusion, attachment of the molecule, Transport via Hemoglobin, Henry's Law – Transport via plasma, Pharmacodynamics, Desired affects, Cumulative effect, Synergism, Potentiation Pharmacological effects of oxygen under pressure. Additionally, learn why HBOT works, offgassing gradients, MDGF, as well as the oxygen window and statistical probability of CNS O2 toxicity
1	Contraindications	Learn the absolute and relative contraindications for hyperbarics and why each is in each category
1	Adverse Reactions	Learn about Middle ear barotrauma, Sinus squeeze, or reverse squeeze, Claustrophobia / Confinement anxiety, progressive myopia, Cataract maturation, Retrolental fibroplasia (Retinopathy of prematurity), Pulmonary barotrauma (Pneumothorax), Pulmonary edema, Patients with reduced left ventricular ejection fractions, Central nervous system oxygen toxicity seizures as well as risk mitigation techniques for all
1	Review Laws and Math	Understand a review of topics listed and Q&A session concerning the homework. Review of homework and grade along with morning warm up exercises of previous day objectives

1	AGE	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for AGE
1	DCS	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for protocols for both DCS and AGE as well as current theory surrounding DCS
1	Anti-Aging	Learn, discuss and debate the rational, patient selection criteria, mechanism of action, clinical management and utilization for the protocols existing for anti-aging. Includes study review and discussion
1	Practical #3 – Startup/Shutdown Checklist	Learn the proper procedures for operating and following a startup and shut down checklist procedure for multiple types of chambers following manufacturers guidelines.
1	CO Poisoning	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Carbon Monoxide poisoning
1	Clostridial Myonecrosis	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Clostridial Myonecrosis
1	Practical #4 – Routine Treatment	Learn descent phase, curvilinear descent, sections with air breaks (as required), ascent phase, colored for gasses on tables, Treatment tables upside down or right side up. Learn that the route of administration is to Increase ambient pressure resulting in increased blood gas through respiration irrespective of if oxygen is applied to the insult directly.
1	Necrotizing Infections	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Necrotizing Infections
1	Sensorineural Hearing Loss	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Sensorineural Hearing Loss
1	Review and QA homework	Review homework and previous day lectures
1	Thermal Burns	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Thermal Burns
1	Anemia	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Anemia
1	Arterial Insufficiencies (Retinal Occlusion)	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Arterial Insufficiencies (Retinal Occlusion). Learn the immediate controlling actions for emergencies as well as the most common patient and facility emergency procedures.
1	Practical #5 – Treatment with Basic EP	Understand and practically demonstrate Emergency Procedures for a recompression chamber. Use and practice section for use of emergency procedures in a chamber.
1	Arterial Insufficiencies (Wounds) #1	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Arterial Insufficiencies

1	Arterial Insufficiencies (Wounds) #2	Learn Measures Skin Perfusion Pressure, Microcirculatory perfusion of the skin, Pulse Volume Recording Waveform amplitude, frequency, and pulse helps evaluate intraluminal changes, Severity of occlusion when using a TCOM and laser Doppler Learn the Wagner scale and reimbursement procedures for hyperbarics and the scale.
1	Practical #6 – Treatment with Advanced EP	Understand and demonstrate knowledge of a complex emergency procedure during a treatment with multiple cascading emergencies. Designed to simulate the worst-case scenario for emergencies with an emphasis on awareness and situational control.
1	Compromised Grafts and Flaps	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Compromised Grafts and Flaps
1	Crush Injury	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Crush Injury
1	Review Days 1-3	Understand a review of topics listed and Q&A session concerning the homework. Review of homework and grade along with morning warm up exercises of previous day objectives
1	Delayed Radiation Injury	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Delayed Radiation Injury
1	Osteomyelitis	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Osteomyelitis
1	Intracranial Abscess	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for Intracranial Abscess
1	Practical #7 – Fire in the Chamber	Demonstrate and rehearse the proper procedure for control of an in-chamber fire in a variety of systems.
1	Off-Label Part Indications 1	Learn, discuss and debate the rationale, patient selection criteria, mechanism of action, clinical management and utilization of treatments for off label indications
1	Off-Label Part 2 / Hyperbaric Research	Learn the recent developments in peer reviewed research in hyperbarics being completed by notable research facilities. Learn that there is a great need for further research and publications in the area of hyperbarics.
1	Practical #8 – Weekly/Monthly/Semi-Annual/Annual Checklists	Demonstrate and ensure completion of the required periodic maintenance and checklists there in for a hyperbaric facility to ensure safety of the system and chambers.
1	Hazardous Marine Life	Learn creatures that are venomous and cause puncture wounds and the treatment for both. Learn the first aid for HMIL bites and stings
1	Physician on Doctor review	Learn detailed biomedical aspects of hyperbaric treatments and Q&A forum for hyperbaric questions from throughout the course.
1	Review course in preparation for exam	Review all homework and examination review
2	Exam	Complete Final Examination administered by independent 3rd party organization.