



International Clinical Hyperbaric Technologist

ICHT

(As required by the International Board of Clinical Hyperbaric Medicine and Technology- IBCHMT)

Guidelines for Accreditation

Dated 6/14/2018

Philosophy

To advance the beneficial effects of HBO within the field of medicine while maintaining the highest standards of safety. To encourage the acceptance and growth of “International Accepted Indications” allowing greater access to treatment thereby improving quality of life. To enhance an international forum of physicians and scientists to advance the field of clinical hyperbaric medicine.

Scope of Practice

The spectrum of hyperbaric medicine is broad and diverse. From in-patient critical care, stable outpatient clinics and veterinarian medicine this wide spectrum of pathology is encompassed. As a result, there needs to be a tiered level of training standards to address the needs of this broad spectrum. Hyperbaric Medicine International (HMI) and its ICHT certifying board model the FDA policy/guideline/position of not interfering with the practice of medicine. An ICHT certification allows a hyperbaric technician to treat any and all diagnoses as directed by their supervising medical practitioner. There is no penalty for treating off-FDA label.

CHT's who are current and in good standing may apply to become a Tier 2 ICHT without additional training requirements until June 14, 2019. If accepted by the IBCHMT through the application process the technician may work in a HMI affiliated center following the guidelines of the HMI accreditation council. After June 14, 2019 CHT's who wish to become Tier 2 ICHT certified will be required to take additional training in concordance with the ICHT guidelines.

The purpose of this document is to describe the minimal training and competencies necessary for all the tiered systems listed above for certification as an International Clinical Hyperbaric Technologist (ICHT) within the United States. Other affiliated countries, such as Australia,

Canada or Mexico may require additional training requirements which will be forthcoming. Tier 3 ICHT certification will require additional training addressing the needs of advanced critical care within the intensive care units and emergency departments of an acute care hospital or trauma center. Training specific to the requirements for mono-place and multi-place will be addressed individually by each training center dependent upon the needs of the applicant. Training requirements within the veterinarian realm is currently in development and will be integrated into the Tiered System.

The Tiered System is as follows:

Tier 1 Clinic based MHBT- Mild Hyperbaric Therapy (up to 1.4 ATA)

As an international standard, some countries are less restrictive with the application of pressures and use of enriched O₂ than the U.S. This standard allows clinicians across the globe to work within their regulatory guidelines and scope of practice. Further, HMI does not recommend or prohibit the use of oxygen, leaving that to the applicable regulatory guidelines for each country, chamber design/approval, and medical/clinical license and scope of practice of the practitioner.

Tier 1 ICHT certification for MHBT may be accomplished with the candidate's successful completion of an IBCHMT approved introductory course, which offers theory, hands-on practice, and a final examination.

Following the successful completion of the approved course, Tier 1 ICHT candidates must:

1. Be at least 18 years of age with a high school diploma or equivalent.
2. Complete the ICHT application form and remit the \$195 application fee, and a \$25 administrative fee for their background check.
3. Submit evidence of the successful completion of an IBCHMT approved introductory course, hands-on practice portion and

final examination. The HMI Council for Accreditation ensures that applicants meet the eligibility criteria and will complete background checks on all applicants.

4. Upon successful completion of this requirement, Tier 1 ICHT certification will remain valid for a 2-year period.
5. Tier 1 ICHT's will be required to maintain a minimum of 12 continuing education credits every 2 years, specific to clinical hyperbaric medicine.

(Tier 1 training requirements are based upon the specific needs of each particular chamber and will be coordinated with the HMI approved training provider.)

Tier 2 Hospital and or Free-Standing Clinics (up to 3.0 ATA)

1. Applicant must be at least 18 years of age with a high school diploma or equivalent.
2. ICHT applicants must have completed an International Board of Clinical Hyperbaric Medical Technology (IBCHMT) approved hyperbaric medicine introductory training course within three years of intended ICHT test date.
3. Upon completion of an approved course, ICHT applicants must undergo a clinical work experience of 480 hours in hyperbaric medicine or aviation medical technology. Forty (40) hours of this requirement must be a supervised direct and physically present clinical internship. The Board must be notified in writing of the name of the preceptor prior to commencing the internship. The preceptor must be an ICHT or a CHT with a minimum of two years' clinical experience.
4. Maintain a minimum 24 continuing education credits every two years specific to clinical hyperbaric medicine.

Tier 3 Critical Care Hyperbaric Medicine- In-patient ICU and ER (up to 6.0 ATA) Qualifying Pathways

This is not an entry-level qualification, rather an additional certification

beyond the applicant's qualifying profession (refer to qualifying pathway list).

1. Respiratory Therapist
2. Physician Assistant
3. Active Duty Military Corpsman
4. EMT/Paramedic
5. Registered Nurse or LPN
6. Nurse Practitioner
7. Physician
8. Chiropractic Physician
9. Veterinarian Physician
10. Veterinarian Technologist
11. Military diving personal
12. Diving Medical Technician
13. Biomedical Technologist
14. Naturopathic Physicians
15. Commercial diving personnel and Diving supervisors

Legal Status

This document has no legal status.

Criminal Background Check

A criminal background check is required for all applicants for ICHT status. A felony conviction will disqualify an applicant as indicated below:

1. All those who are convicted of an offense, the degree of which disqualifies any individual from employment within a health care setting that receives government (namely Medicare and Medicaid program payments) funds is permanently ineligible to sit the ICHT examination. Affiliated countries outside the United States may have variations to this ruling dependent upon the requirements of their legal system.
2. If a subsequent background check on a current ICHT notes

- conviction for an offense consistent with No.1 above, that ICHT will immediately and permanently forfeit their certification. They will not be considered eligible for re-certification at any subsequent time period.
3. An exception to No. 1 and 2 above would be an individual who subsequently had their conviction overturned or otherwise expunged from their criminal record.

Competency Standards

This document describes the minimum general requirements and competency levels required of an ICHT.

Minimum General Requirements

Understand:

1. Physical aspects of pressurized exposure
2. Basic calculations for the conversion of common pressure units used in clinical hyperbaric medicine (examples include feet/meters, atm/ATA psi/bar/kPa, Kg/pound etc.)
3. Basic physical units used in clinical hyperbaric medicine
4. Boyle's Law (calculating air volumes, air consumption and the inverse relationship between
5. pressure and volume)
6. Dalton's Law (partial pressure of gases at various depths)
7. Gay Lussac's Law (the relationship between pressure and temperature changes in a fixed volume)
8. Henry's Law (the effect of gas partial pressures on solubility of various gases in liquids and their corresponding effects on decompression)
9. The principles of heat transfer by conduction, convection and radiation
10. Mechanism of action for International Accepted Indications:
11. Direct effects of pressure change; how and where potential barotrauma occurs

- a. Ears
 - b. Sinus Spaces
 - c. Teeth
 - d. Lungs
 - e. G.I. Tract
12. Signs and symptoms of decompression illness (DCI) and oxygen toxicity
13. Relevant aspects of clinical hyperbaric medicine on anatomy and physiology pertaining to the following systems:
- a. Musculoskeletal
 - b. Neurological
 - c. Integumentary
 - d. Cardiovascular
 - e. Respiratory

Possess the capability to provide clinical support and assist in the prevention and/or management of pressure related problems:

1. Ear squeeze and other barotraumas
2. Carbon dioxide (CO₂) retention
3. Carbon monoxide (CO) poisoning
4. Hyperbaric chamber atmosphere contamination
5. Built-in breathing system (BIBS) contamination
6. Oxygen (O₂) toxicity
7. Anoxic and hypoxic events
8. Nitrogen (N₂) narcosis
9. Decompression illness (DCI)
10. Hypothermia and hyperthermia
11. Seizure occurrence

Gas Systems, its Storage, Compression and Piping

Understand and/or conduct procedures for chamber operations and life support systems

1. Tests for purity and oxygen content of gases
2. Mathematical calculations of gas usage
3. Principles and use of gas analyzers
4. Importance of oxygen cleanliness in a gas delivery system
5. Gas line filtration
6. Calibration of gas analyzers
 - a. Delivery of multiple gases during hypo/hyperbaric operations
 - b. Monitor chamber for depth, temperature and humidity, using commonly available equipment
 - c. Calibration and verification of analyzing equipment
7. Basis for gas stratification and its prevention
8. Maintain a legible and accurate record of all aspects of the hyperbaric delivery system
9. Maintain a gas status board showing gas reserves and mixtures
10. Understand operation of air compressor and its backup
11. Monitoring and reporting of LOX (Liquid Oxygen Gas) system levels
12. Monitoring manifold systems for compressed gases: oxygen reserve and medical air

Chamber Operations and Environment

Understand:

1. Procedures for operating a hyperbaric chamber -chain of command and procedures in case of an emergency
2. Inside attendants' responsibilities in a multi-place hyperbaric chamber
3. The system checks and user maintenance needed before and after using a hyperbaric chamber
4. Pre-and post-dive checks of a hyperbaric chamber complex using specific checklists
5. The operation and design of medical locks, including various types of interlocks and safety devices
6. The principles of operation of various items of equipment used in

a typical hyperbaric system, such as compressors, fire suppression systems

7. The characteristics of and maintenance requirements for acrylic viewports in oxygen compressed mono-place chambers
8. The monitoring of internal chamber operations
9. The monitoring of internal/external chamber gas quality and gas system quality
10. The operation, function testing and selection of gas supplies for multi-place chamber patient breathing systems, including routine maintenance and repairs
11. Compression and decompression procedures for all clinical indications
12. The construction and purpose of valves, fittings, gauges, regulators, hoses and pipe work
13. How to carry out normal operations and maintenance on air and medical gas and fluid systems
14. The differences between various thread forms and their rationale
15. The principles of chamber life support systems with priority on pre-operational checklists, monitoring during use and routine maintenance
16. Proper identification of various gas cylinders
17. Proper handling and storage of high pressure gas cylinders
18. Emergency preparedness for fire, loss of oxygen, loss of communications and medical complications
19. The use of various types of fire suppression systems including routine maintenance and operational checks
20. The various substances and materials, which are prohibited inside a chamber
21. Appreciate the unique differences between mono-place and multi-place chambers
22. Familiarity with the following regulatory agencies and related organizations: Food and Drug Administration (FDA), Centers for Medicare and Medicaid Services (CMS), Occupational, Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), American Society of Mechanical Engineers

(ASME), American Society of Mechanical Engineers' Committee, Pressure Vessels for Human Occupancy (ASME PVHO), Joint Commission (JC), and relevant international regulatory boards.

Clinical Skills/Supervised

Possess a basic understanding in the operation of biomedical devices within the hyperbaric medicine department.

Be able to carry out relevant diagnostic and clinical procedures such as:

1. Assess patient for pain and document findings
2. Obtain vital signs (pulse, respiratory rate, core temperature, blood glucose and blood pressure) and perform examination of the tympanic membrane
3. Observe and document for changes in neurological status
4. Know when to use appropriate clean and sterile techniques
5. Be familiar with collection and removal of patient waste products, disposal of sharps and biological waste
6. Assist in patient care procedures; dressing changes
7. Basic EKG recognition; set alarm parameters; print and post strip
8. Ability to safely transfer patient and operate stretchers, gurneys, wheelchairs, beds and other assistive devices
9. Comply with quality control (QC) measures; glucometer
10. Prepare patient for treatment
 - a. Positioning comfortably and checking for any Velcro attachments on diapers, tracheal tubes, urine bags etc.
 - b. All cotton garments or other approved materials only for in chamber use
 - c. EKG and TCOM lead placement, as ordered
 - d. Age specific patient education on fundamentals of HBO treatment; equalizing ear pressure
 - e. Provide patient comfort measures and assurance of safety

Generalized Clinical Knowledge

Have a basic understanding of the risks, side effects and hazards of

certain medications in the hyperbaric chamber.

1. Maintain CPR and the ability to establish an airway
2. Describe the signs, symptoms and immediate management of hyper- and hypothermia and seizure occurrence
3. Describe the general effects of gases on the body
4. Describe the effects of pressure on the body and the principles of decompression and therapeutic procedures
5. Understand proper body mechanics to protect from self-injury
6. Practice communication with all levels of hyperbaric medical team
7. Understand basic medical terminology
8. Practice proper use and application of restraints when ordered by physician; assess circulation
9. Assure patient privacy and confidentiality; observe HIPAA requirements
10. Practice infection control measures
 - a. Universal precautions
 - b. Use of approved disinfectants for chamber and equipment; recognizing risks associated with off-gassing of chemicals in the chamber
 - c. Hand washing
 - d. Personal protective equipment (PPE)
 - e. Disposal of infectious and biological waste

Clinical Internship in Hyperbaric Technology

Required for Tiers 2 & 3 ICHT certification

Introduction

In order to facilitate entry for certification in hyperbaric technology, the International Board of Clinical Hyperbaric Medical Technology has established a set of clinical internship guidelines.

Graduates of approved introductory training programs in hyperbaric technology and/or medicine are subsequently required to undergo a minimum clinical internship of 480 hours. Forty (40) hours of supervised

clinical internship must be preceptor-based. As a minimum requirement, each designated facility preceptor(s) must be an International Clinical Hyperbaric Technologist with a minimum of two (2) years of clinical hyperbaric medicine experience. The Board must be notified in writing of the name of the preceptor and respond with approval prior to commencing the supervised preceptorship.

Clinical internship guidelines that follow are general in nature. They are divided into five categories, with specific topics listed for each category. The objectives for each topic are described under the heading “Internship Objectives”. Some of the topics have been expanded to include “Additional Objectives”. Interns should be encouraged to achieve each of the additional objectives in whichever topics are of particular interest, or most applicable to their situation. This approach allows individuals with varied skills and backgrounds to utilize a common program of clinical training.

These internship guidelines are not specific to a particular facility or method of delivery of hyperbaric oxygen therapy. Rather, they provide the broadest possible subject matter so that each center can tailor these guidelines to best fit their respective resources and areas of expertise. It should be kept in mind that the objective of this program is to provide the intern with a broad-based general knowledge.

Chamber Equipment Compressed Gas Supply and Storage

Chamber Compression Gas

- **Internship Objectives:** Know and demonstrate knowledge of the routing of the compression gas supply and the Quality Assurance procedure to ensure gas purity and oxygen content.
- **Additional Objectives:** Inspect the entire gas supply pathway. This will vary, depending upon chamber type. High pressure or cryogenic oxygen storage, or low-pressure compressor intake to pressure reducing or compression mechanisms, to accumulators,

zone shut-off -valve to chamber control valving and flow lines should be identified, respectively.

Breathing Gas Supply

- **Internship Objectives:** Know and demonstrate knowledge of the source of the breathing gas supply and the Quality Assurance procedure to ensure gas purity and oxygen content. Practice proper connection and operation of breathing gas supply.
- **Additional Objectives:** Inspect the entire breathing gas supply pathway(s). This may involve multiple gas mixtures and oxygen in multi-place chambers, and both oxygen and compressed air in mono-place chambers. Special attention should be directed to pressure reduction, isolation and emergency shut-off procedures. Conduct troubleshooting and maintenance of the breathing gas system(s): i.e. regulator, flow meter, humidifier, overboard dump and patient delivery system.

Fire Extinguishing System

- **Internship Objectives:** Be familiar with the fire extinguishing system activation procedures for the chamber (where fitted) and the surrounding hyperbaric facility. Operate handheld hose(s), where fitted, and be familiar with the operation of portable handheld devices. Recognize the fire alarm(s).
- **Additional objectives:** Inspect the water tanks, water delivery, fire director sensors and alarm panel (where fitted). Review maintenance and troubleshooting procedures.

Communications

- **Internship Objectives: Be familiar with applicable forms of voice and visual communications.**
- Recognize factors that may influence or complicate operator/inside attendant/patient communications.

Chamber Operations

Chamber Standard Operating Procedures

- **Internship Objectives:** Know and be able to perform the chamber(s) standard operating procedures.
- **Additional Objectives:** Inspect chamber console/panel layout. Locate and operate manual and automatic controls.

Chamber Emergency Operating Procedures

- **Internship Objectives:** Know, and be able to perform, the chamber operating procedures that become necessary under various emergency situations.
- **Additional Objectives:** Inspect chamber console/panel layout, as it pertains to emergency and override controls.

Checklists, Decompression Tables and Treatment Protocols

- **Internship Objectives:** Be familiar with all chamber checklists (equipment and patient). Have a working knowledge of decompression procedures. Have a working knowledge of all hyperbaric treatment protocols.
- **Additional Objectives:** Demonstrate a working knowledge of U.S. Navy air decompression table computations. (Required for multi-lock chamber operations)

Patient Treatment and Staff Dive Records

- **Internship Objectives:** Be familiar with all of the procedural and operational aspects necessary to institute hyperbaric oxygen therapy protocols.
- **Additional Objectives:** Compile a record of typical patient treatments in accordance with local operating procedures.

Support Equipment and Supplies

- **Internship Objectives:** Be familiar with all chamber and patient ancillary equipment (ECG and pressure monitor; infusion pump; suction apparatus; transcutaneous oxygen monitor; mechanical ventilator; blood pressure and vital signs monitors; Ambu bag etc.). Know all of the supplies necessary to support elective and

emergent patient referrals. Be able to identify the effects of pressure on ancillary equipment and supplies. Recognize any associated safety hazards.

- **Additional Objectives:** Practice set-up, operation and troubleshooting of all ancillary equipment.

Patient Preparation, Loading and Unloading

- **Internship Objectives:** Know and demonstrate knowledge of patient preparation for hyperbaric oxygen therapy. Know the correct procedure for transferring patient into and removing from the chamber.
- **Additional Objectives:** Practice patient preparation procedures with particular attention to physical, physiological and equipment risk factors. Practice chamber loading and unloading of patients.

Fire Safety

- **Internship Objectives:** Know and demonstrate knowledge of how to prevent/minimize electrostatic spark discharge and control/minimize static electricity accumulation and other potential ignition sources. Appreciate the effect of hyperbaric oxygen environments and burning rates of materials that are allowed, and those not allowed, in the chamber. Know how to control oxygen levels in multi-place chambers to within operational limits.

Pressure Safety

- **Internship Objectives:** Know and demonstrate knowledge of the correct procedure for operating/securing all doors, hatches and other pressure boundary accesses. Know the proper setup and connection of all pass-throughs. Know all of the potential pressure hazards in and around the chamber.
- **Additional Objectives:** Practice operation of all pressure boundary doors and hatches. Practice set-up, operation and maintenance of all pass-throughs.

Patient Assessment

Initial Consultation

- **Internship Objectives:** Know and demonstrate knowledge of the International Accepted Indications for hyperbaric medicine evaluation and the related beneficial mechanism(s). Know the treatment plan and appreciate the duties of each of the hyperbaric staff members involved in the patient's care.
- **Additional Objectives:** Observe an initial consultation. Review patient's reason for referral, previous medical management, physical, neurological and vascular examinations. Assist in transcutaneous oxygen testing (if applicable) and physician interpretation. Formulate and rationalize a treatment plan.

Facility tour, patient preparation and informed consent

- **Internship Objectives:** In preparation for the therapy and following the consultation with a clearing physician, patient should be given a tour of the facility to see the technology, meet the staff and understand the hyperbaric (and wound care) procedure step by step from arrival to discharge day. This will help the patient in making an informed decision to start the therapy, identify the goal and minimize anxiety. At the end of the tour the patient should be well informed to sign the informed consent.

Ongoing Assessment

- **Internship Objectives:** Appreciate the various clinical and diagnostic indicators necessary to evaluate therapeutic response during the treatment course.
- **Additional Objectives:** Undertake patient evaluation during the treatment course. Determine patient compliance and cooperation. Evaluate for side-effects, including, but not limited to, middle ear/tympanic membrane changes and blood glucose issues.

Follow-up Assessment

- **Internship Objectives:** Appreciate periodic patient follow-up parameters. Appreciate clinical and diagnostic responses, need for

- other therapy, prognosis.
- **Additional Objectives:** Attend periodic patient follow-up visits. Determine any complications and side-effects to hyperbaric oxygen therapy.

Patient Care

Patient Pre-treatment Briefing

- **Internship Objectives:** Know and demonstrate knowledge of the risks and potential side-effects of exposure to hyperbaric oxygen dosage.
- **Additional Objectives:** Brief patient concerning the physical effects of changes in environmental pressure. Brief patient on the correct procedures to limit/reduce the likelihood of barotrauma to the lungs, sinus spaces, ear, teeth and gastrointestinal tract. Brief the patient concerning known risk factors for exposure to hyperbaric oxygen dosage.

Barotrauma Management

- **Internship Objectives:** Know and demonstrate knowledge of the signs and symptoms of barotrauma. Know and demonstrate knowledge of the immediate management of barotrauma.
- **Additional Objectives:** Instruct and assist patients during compression and decompression phases.

Oxygen Toxicity Management

- **Internship Objectives:** Know and demonstrate knowledge of the signs and symptoms of central nervous system intolerance to hyperbaric doses of oxygen. Know and demonstrate knowledge of the signs and symptoms of pulmonary oxygen toxicity. Know and demonstrate knowledge of the various methods that serve to reduce the likelihood of oxygen toxicity. Know and demonstrate knowledge of the immediate management of CNS oxygen toxicity.
- **Additional Objectives:** Appreciate the complicating factors

associated with the development of pulmonary oxygen toxicity.

Hypoglycemia Management

- **Internship Objectives:** Know and demonstrate knowledge of the differential diagnosis of hypoglycemia vs. CNS oxygen toxicity. Appreciate the methods of determining blood glucose. Appreciate methods of correcting hypoglycemia.
- **Additional Objectives:** Witness blood glucose assessment. Determine prophylaxis or correctional requirements for diabetic patients pre-HBO, where indicated.

Decompression Sickness Management

- **Internship Objectives:** Know and demonstrate knowledge of the procedures necessary to prevent/reduce the incidence of iatrogenic decompression sickness. Recognize the common clinical manifestation of decompression sickness.
- **Additional Objectives:** Appreciate the differential diagnosis of decompression sickness and cerebral arterial gas embolism.

Pulmonary Barotrauma

- **Internship Objectives:** Know and demonstrate knowledge of the risk factors for pulmonary barotrauma of ascent. Appreciate the differential diagnosis of cerebral arterial gas embolism vs. pneumothorax vs. tension pneumothorax vs. mediastinal emphysema vs. subcutaneous emphysema. Know and demonstrate knowledge of the various risk factors that increase and decrease the risk of pulmonary barotrauma. Know and demonstrate knowledge of immediate management of suspected pulmonary barotrauma of ascent.
- **Additional Objectives:** Appreciate the definitive management of the various forms of pulmonary barotrauma of ascent.

Cardiopulmonary Complications

- **Internship Objectives:** Demonstrate proficiency in obtaining vital signs. Know and demonstrate knowledge of the common clinical signs of severe, acute onset, cardiovascular distress. Demonstrate

- proficiency in CPR.
- **Additional Objectives:** Appreciate normal vs. abnormal ECG wave forms. Appreciate basic methods of airway control.

Infection Control

- **Internship Objectives:** Know and demonstrate knowledge of universal precautions and supplemental local infection control policies. Practice universal and local specific infection control precautions.
- **Additional Objectives:** Recognize patient and equipment risk factors for cross-contamination.

Patient Comfort

- **Internship Objectives:** Know and demonstrate knowledge of the various procedures necessary to ensure patient comfort and thermal control. Know and demonstrate knowledge of the signs and symptoms of claustrophobia and confinement anxiety.
- **Additional Objectives:** Appreciate the various methods helpful in overcoming confinement anxiety.

Wound Care

- **Internship Objectives:** Appreciate the general principles of wound homeostasis; infection control and wound healing principles and non-surgical wound care.
- **Additional Objectives:** Assist in the evaluation of wounds. Assist in the limited debridement of wounds and appreciate the different types of wound dressings and their respective applications.

Documentation

- **Internship Objectives:** Know and demonstrate knowledge of all forms and paperwork used to document patient treatment.
- **Additional Objectives:** Complete pre-treatment patient assessment and treatment protocol forms. Complete ancillary patient chart notes and post-treatment documentation.

1. Anticipated normal values
2. Control/reference sites
3. Normobaric air breathing
4. Normobaric oxygen breathing
5. Hyperbaric oxygen breathing
6. Documentation and data recording
7. Common testing errors

Examination Background

It is not the intention of the Board to provide an “entry level” pathway for certification in hyperbaric technology. Certification is made available as an “added qualification” for licensed or certified health care, and related professionals whose professional duties include the medical and/or technical application of undersea, hyperbaric or aviation medicine.

A test bank of several hundred questions is used to develop each applicant’s examination. The test bank is monitored regularly and updated as indicated.

A concerted effort has been made to ensure little or no bias regarding each examinee’s orientation – multi-place or mono-place, civilian or military. There may be questions that relate to a specific hyperbaric setting, however, one’s strengths should compensate for one’s weaknesses. Due to the breadth of this discipline no one is expected to have a complete and comprehensive knowledge of all operating systems and related technologies.

A score of at least 70% correct is required to pass the exam. Scores of 90% or greater are graded “With Distinction”. A ‘With Distinction’ grade is only achievable on the first examination attempt.

Examination opportunities are offered at various venues throughout the year. Special arrangements can be made to have the examination proctored at regional community colleges and other educational institutions approved by the Board. It has been deemed inappropriate for hyperbaric programs to provide “in house” examination proctorship.

Stringent controls are in place to ensure the examination is conducted impeccably.

The examination period lasts for two hours. Plan to be at the test site at least 15 minutes early, for an explanation of the testing process and distribution of the examination. Questions are either multiple choice or true-false. Each set of questions at a testing location will be unique and identified with the examinee's name. It is absolutely necessary, therefore, for each prospective examinee to pre-register with the IBCHMT well in advance of the scheduled test date. Applicants will not be permitted to register at the testing site on the day of the exam.

Bring several #2 pencils and positive identification. Government issued photographic identification will be required of each examinee in order to enter the testing area and receive their examination. A pocket calculator may be helpful. However, it is not absolutely necessary. Decompression tables and scratch paper will be provided.

Certification/Recertification

Examination registration applicants must complete an IBCHMT Certification Examination Registration Form and return it to IBCHMT headquarters with the following:

1. A copy of an IBCHMT approved Introductory Hyperbaric Medicine Training Course certificate of completion.
2. A copy of qualifying vocation license or certificate.
3. Upon completing an approved course, ICHT applicant must undergo a clinical work experience of 480 hours in undersea, hyperbaric medicine or aviation medicine technology. Forty (40) hours of the requirement must be a supervised clinical internship. The Board must be notified in writing of the name of the preceptor prior to commencing the internship. The preceptor should be an ICHT with a minimum of two years' experience.
4. Payment in the amount of \$195.00 (US Funds)
5. A completed 'Code of Conduct' declaration.

As stated above, CHT's who are current and in good standing may apply

to become a Tier 2 IHCT without additional training requirements until September 1st, 2019. Upon acceptance by the IBCHMT and payment of the application fee of \$195.00 the newly accepted ICHT may work within an HMI affiliated center. Based upon the acceptance date the current CEU requirements will then apply within the guidelines of recertification put forward by the IBCHMT. Proof of a minimum of 100 hours of employment must be provided to the IBCHMT.

Expiration Date

Certification is awarded for a period of two (2) years. Expiration of certification will occur on the last day of the month applicants passed the examination, two years hence. Example: Individuals successfully completing the examination on any day during May of 2014 will have an expiration date of May 31, 2016. Certification is maintained through a system of verified continuing education.

Re-certification

Re-certification is awarded upon completion and verification of required continuing education credits, continued workplace experience, submission of the re-certification form and a \$100.00 fee.

Applicants must complete an IBCHMT Clinical Hyperbaric Technologist Re-Certification Form and return to IBCHMT headquarters, along with the following:

Tier 1 ICHT:

1. Proof of a minimum of 12 continuing education credits every 2 years, specific to clinical hyperbaric medicine. Training requirements are based upon the specific needs of each particular chamber and will be coordinated with the IHMA approved training provider.
2. Letter (on letterhead) from place of employment confirming accumulation of at least 100 operational experience hours during the prior two (2) years.
3. Check, credit card or money order in the amount of \$100.00 (US Funds) made payable to the IBCHMT.

Tier 2 and 3 ICHT: 1.

1. Proof of a minimum of 24 (minimum of 12 Category “A”) CEU hours during the prior two (2) years.
2. Letter (on letterhead) from place of employment confirming accumulation of at least 100 operational experience hours during the prior two (2) years.
3. Check, credit card or money order in the amount of \$100.00 (US Funds) made payable to the IBCHMT.

Continuing Education Requirements Tier 2 and 3 applicants

A minimum of 24 hours of education credits (hours) are required during each re-certification period. At least 12 must be Category A, defined as education and training directly related to the practice of clinical hyperbaric. Of these 12 credits, at least 9 (75%) must relate to ‘core competency’, namely technical, operational and safety aspects of the hyperbaric/hypobaric delivery system.

They may be earned through attendance at meetings and conferences that have received prior-approval from the IBCHMT to award such credits. They may also be obtained through each ICHT’s institutional employer who provides periodic knowledge and skills maintenance, and skills updating, likewise approved by the IBCHMT.

Online opportunities also exist at <http://www.hyperbaricmedicineinternational.org>. If not all of the 24 hours are Category A, the balance can be made up with Category B credits. These are defined as those programs and courses that provide more generalized information related to allied health care professional knowledge and skills.

Examples include BLS and ACLS certification/recertification, clinical practice and compliance updates, emerging technologies, potential new uses, etc. ICHT’s who attend at meetings where CEU’s are offered are also eligible for credits.

Failure to Recertify

ICHT’s who fail to recertify upon completion of any two-year certification

period are offered a 12-month grace period. Application for recertification within this grace period will incur a \$100.00 penalty, in conjunction with the standard \$100.00 recertification payment. All of the application requirements noted above for regular ICHT recertification will apply.

Those who fail to recertify within the 12-month grace period have one remaining option, providing that they have maintained active certification or licensure in a qualifying pathway. In these cases the applicant will be required to re-take the ICHT examination. This option is only valid for a period of 12 months following expiration of the 12-month grace period.

Those who have not maintained active certification or licensure do not have the option to attempt recertification following expiration of their grace period. They will be required to apply for certification in hyperbaric technology as an entirely new applicant, as will all of those whose ICHT lapsed beyond the two-year period from their initial respective recertification dates. This process includes successful completion of an IBCHMT approved hyperbaric training course within the previous two years of the re- application date. Failure to re-certify does not require the ICHT to repeat the internship.

Failing and Retaking the Exam

- If on the first attempt the examination is failed, the ICHT applicant must wait six months before retaking the exam. This should afford adequate study time.
- If on the second attempt the examination is again failed, the ICHT applicant is required to retake a IBCHMT Approved Hyperbaric Medicine training course in addition to waiting six (6) months before retaking the exam.
- If on the third attempt the examination is failed, the ICHT applicant is no longer allowed to retake the examination.

Testing Resource Materials

Much of the material used to generate the examination question bank has been taken from the following resources:

1. National Fire Protection Association 99, Chapter 14, 2015 edition
2. Hyperbaric Facility Safety: A Practical Guide. Workman WT, Editor, 1999. Best Publishing Company. ISBN: 0-941332-76-4
3. Hyperbaric Medicine Practice, 3rd Edition, 2008. Kindwall EP and Whelan HT, Editors. Best Publishing Company. ISBN: 9-780941332-78-1, or Physiology Medicine of Hyperbaric Oxygen Therapy, 2008: Neuman Ts, Thom SR. Saunders Publishing. ISBN 978-1-4160-3406-3
4. Textbook of Hyperbaric Medicine, 6th Edition, 2017 Kewal K. Jain

IBCHMT Standards and Review of Certificate

The IBCHMT conducts a certification program for applicants and registrants. It does not, however, warrant job performance of applicants and registrants.

In applying for certification, an applicant agrees that:

1. They will comply with all rules of the IBCHMT, including the requirements of the ICHT Code of Conduct.
2. The IBCHMT certificates, cards, logos, emblems, the name "International Board of Clinical Hyperbaric Medical Technology," and abbreviations relating thereto are all the exclusive property of the Board and may not be used without the Board's express written consent.

Score Reports

The Board is concerned with reporting only valid certification examination scores. On rare occasions, misconduct or circumstances beyond the individual's control may render scores invalid. If doubts are raised about a score because of these or other circumstances, the Board expects all individuals to cooperate fully with any Board investigation. The Board reserves the right to cancel any exam score if, in the sole opinion of the Board, there is evidence of any form of cheating.

Violations

The Board may revoke or otherwise take action with regard to the

application or certificate of an applicant or registrant in the case of:

1. Failure to comply with any rule of the Board;
2. Dishonesty in connection with any Board examination;
3. Any misrepresentation, misleading statement or fraud, by commission or omission, to the Board or otherwise;
4. Sexual abuse, molestation or harassment of a present or former patient or other person;
5. Use of any drug or intoxicant to a degree which impairs objective professional performance;
6. Prescribing, selling or administering any substance except as permitted by law;
7. Unauthorized disclosure of confidential patient information;
8. Gross or repeated negligence of malpractice in professional work;
9. Incapacity, impairment or incompetence to perform professional work;
10. The conviction of a felony; or
11. Dishonorable, unethical or unprofessional conduct.

Violation of Board standards

When the Board has reason to believe that a violation set forth in the section immediately above has occurred by any applicant or ICHT, the Board shall send to that person, by certified mail, a statement of the alleged violations of the Board's standard. Such statement shall set forth the applicable rule(s):

1. A statement of facts constituting the alleged violation of the rule(s).
2. They will immediately relinquish using their certificate of certification, wallet card, logo, emblem and the Board's name and related abbreviations in case of their suspension, limitation, or revocation of certification status.
3. If they refuse to immediately relinquish, refrain from using, and correct at their expense, any misuse or misleading use, of any of the above items when requested, the individual agrees that the Board shall be entitled to obtain injunctive relief, damages, costs

- and attorney's fees incurred in obtaining any such or other relief.
4. That the individual may request a hearing for the disposition of the allegations, with the individual bearing their own expenses for such matter;
 5. That the individual shall have 30 days after receipt of the statement to respond to the allegations in writing and notify the Board as to a request for a hearing on the record;
 6. A statement that the individual may appear in person with the assistance of counsel, may examine and cross-examine any witness under oath, and produce evidence on his/her behalf;
 7. That the truth of allegations or failure to respond may result in sanctions including certification revocation; and
 8. That if the individual does not request a hearing, the individual consents that the Board may render a decision and apply available sanctions. The Hearing Panel shall determine all matters relating to the hearing. The hearing and related matters shall be subsequently determined on the record by majority vote.

Hearing

If an individual disputes the allegations or available sanctions or requests a hearing (request to be filed within 30 days of notice of violation), the Board shall:

1. Schedule a hearing within 30 days of the request for a hearing and send by certified mail, return receipt requested, Notice of Hearing to the individual.
2. The Notice of Hearing shall include a statement of the time and place of the hearing. The
3. hearing can be conducted by a telephone conference call.
4. The Hearing Panel shall consist of three members of the IBCHMT Board of Directors.
5. The Hearing Panel shall determine all matters relating to the hearing. The hearing and related matters shall be subsequently determined on the record by majority vote.

Evidence Formal rules of evidence shall not apply. Relevant evidence

may be admitted. Disputed questions shall be determined by majority vote.

Sanctions

Sanctions for violation of a Board standard may include, but are not limited to, one or more of the following:

1. Revocation;
2. Non-renewal;
3. Suspension;
4. Censure;
5. Reprimand;
6. Retest;
7. Educational requirement;
8. Reports to the Board.

Appeal

1. If the decision rendered by the Hearing Panel finds the allegations are not established, no further action on the appeal shall occur.
2. If the decision rendered by the Hearing Panel is not favorable to the individual, that person may appeal the decision to the Board of Directors. Any appeal must be made in writing to the IBCHMT within 30 days of the notice of the Hearing Panel's decision. A panel of three members of the Board of Directors shall determine the appeal by a majority vote.
3. The Board President shall select the members of the Appeals Panel
4. The Appeals Panel shall consist of members of the full Board of Directors who did not take part in the decision of the Hearing Panel.
5. The Appeals Panel shall render a decision on the record without oral hearing.

Decision

The decision of the Hearing Panel or the Appeals Panel shall be rendered in writing, following the hearing or any briefing. The decision shall contain factual findings, conclusions of law and any sanctions applied. It

shall be transmitted to the individual by certified mail.

Submission of Information to the Board Concerning Possible Violation of Board Standards

Persons concerned with possible violation of Board standards should submit such information in writing. This information should identify the person/persons alleged to be involved and the facts concerning the alleged conduct, in as much detail and specificity as possible, with available documentation. The statement should identify by name, address and telephone number the person making the information known to the Board and others who may have knowledge of the facts and circumstances concerning the alleged conduct.

International and Domestic Certification Portability

ICHT's who were certified in the US who wish to relocate to another country for employment will be required to satisfy the requirements specific to that country. However, the existing training should be transferrable thereby minimizing the need to unnecessarily repeat courses. Courses should be available for the transferee to take the additional training requirements specific to that country. Current CHT's certified by the NBDHM can apply to obtain ICHT certification as long as they meet the requirements of the IBCHMT. The ICHT certification is no guarantee that they will be accepted by the NBDHMT.