

# Certified Hyperbaric Technologist<sup>®</sup>

## Resource Manual



**National Board of Diving & Hyperbaric Medical Technology**

[www.nbdhmt.org](http://www.nbdhmt.org)

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## **Scope of Practice**

### **Purpose**

The purpose of this document is to describe the training and competencies necessary to become certified as a hyperbaric technologist is not an entry-level qualification, but rather an additional certification beyond the applicant's qualifying profession (refer to qualifying pathway list).

### **Qualifying Pathways**

1. Respiratory Therapist
2. Registered Nurse
3. Licensed Practical Nurse
4. Licensed Vocational Nurse
5. Nurse Practitioner
6. Physician Assistant
7. EMT/Paramedic
8. Active-Duty Military Corpsman
9. Fully Licensed Physician

### **Legal Status**

This document has no legal status.

### **Criminal Background Check**

A criminal background check (paid for by applicant) is required for all applicants for CHT® 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 are permanently ineligible to sit the CHT examination. This applies even if an individual chooses not to work in a facility that receives government funds.
2. If a subsequent background check on a current CHT notes conviction for an offense consistent with No.1 above, that CHT will immediately and permanently forfeit their certification. They will not be considered eligible for recertification at any subsequent period.
3. An exception to No.'s 1 and 2 above would be an individual who subsequently had their conviction overturned or otherwise expunged from their criminal record.
4. An individual who, upon application, is found to have a conviction, the degree of which would prevent that individual from employment in a health care facility (as defined in No. 1 above), for a period of five years, is likewise ineligible to sit the CHT examination for a period of five years from completion of their sentence.
5. If a subsequent background check on a current CHT notes conviction of an offense consistent with No. 4 above, they will immediately forfeit their CHT certification. They will become eligible to re-apply for CHT status, as a new applicant, following a period of five years from completion of their sentence.

## Competency Standards

This document describes the minimum general requirements and competency levels required of a CHT®.

### Training and Competency

1. Be at least 18 years of age with a high school diploma or equivalent.
2. CHT® applicants must have completed a National Board of Diving & Hyperbaric Medical Technology (NBDHMT) approved hyperbaric medicine introductory training course within three years of intended CHT® test date.
3. Upon completion of an approved course, CHT® applicants must undergo clinical work experience of 480 hours in undersea, 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 should be either a CHT or a CHRN with a minimum of two years' experience.
4. Military personnel must complete 1000 clinical hours in addition to required, approved, training received in the military (unless 480 hours of approved clinical internship can be completed at an NBDHMT approved facility).
5. Maintain a minimum of 24 continuing education credits every two years with at least 12 of those specific to undersea/hyperbaric operations, technical and safety aspects. See section titled Continuing Education Requirements.

### Minimum General Requirements

Understand:

1. Physical aspects of pressurized exposure
2. Basic calculations for the conversion of common pressure units used in diving and hyperbaric practice (examples include feet/meters, psi/bar/kPa, Kg/pound etc.)
3. Basic physical units used in diving and hyperbaric practice
4. Boyle's Law (calculating air volumes, air consumption and the inverse relationship between pressure and volume)
5. Dalton's Law (partial pressure of gases at various depths)
6. Gay Lussac's Law (the relationship between pressure and temperature changes in a fixed volume)
7. Henry's Law (the effect of gas partial pressures on solubility of various gases in liquids and their corresponding effects on decompression)
8. The principles of heat transfer by conduction, convection and radiation
9. Mechanisms of action for Undersea & Hyperbaric Medical Society recommended hyperbaric oxygen therapy indications
10. Direct effects of pressure change; how and where potential barotrauma may occur
  - a. Ears
  - b. Sinus spaces
  - c. Teeth
  - d. Lungs
  - e. G.I. Tract
11. Signs and symptoms of decompression illness (DCI)
12. Relevant aspects of diving and 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 (CO<sub>2</sub>) retention
3. Carbon monoxide (CO) poisoning
4. Hyperbaric chamber atmosphere contamination
5. Built-in breathing system (BIBS) contamination
6. Oxygen (O<sub>2</sub>) toxicity
7. Anoxic and hypoxic events
8. Nitrogen (N<sub>2</sub>) narcosis
9. Decompression illness (DCI)
10. Hypothermia and hyperthermia
11. Hypoglycemia
12. Endotracheal cuff

### **Gas Systems**

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 within a hyperbaric delivery system
5. Filtration requirements
6. Calibration of gas analyzers
  - a. Delivery of multiple gases during Class A chamber 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 Class A chamber gas stratification and prevention
8. Maintain a legible and accurate record of all aspects of the hyperbaric delivery system operations
9. Maintain a Class A chamber status board showing gas reserves and mixtures

### **Chamber Operations and Environment**

Understand:

1. Procedures for operating a hypobaric and hyperbaric chambers
2. Inside attendants' responsibilities in a hypobaric and hyperbaric chamber
3. The system checks and user maintenance needed before and after using a hypo/hyperbaric chamber
4. Pre and post treatment checks of hypobaric and hyperbaric chamber facilities
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 windows

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 multiplace 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 medical gas and fluid systems
14. The differences between various thread types 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 such as cardiac arrest, oxygen toxicity and suspected pneumothorax,
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 monoplac and multiplace chambers
22. Familiarity with the following regulatory agencies and related organizations: National Board of Diving & Hyperbaric Medical Technology (NBDHMT), 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 on Pressure Vessels for Human Occupancy (ASME PVHO), Joint Commission (JC), De Norske Veritas (DNV) and the Undersea and Hyperbaric Medical Society (UHMS)

**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. Pre-treatment safety "time out" safety checks
2. Assess patients for pain and document findings
3. Obtain vital signs (pulse, respiratory rate, body temperature, and blood pressure)
4. Blood glucose checks for diabetic patients
5. Observe for changes in neurological status
6. Know when to use appropriate clean and applicable sterile techniques
7. Collection and removal of patient waste products
8. Assist in patient care procedures, dressing changes
9. Ability to safely operate stretchers, gurneys, wheelchairs, beds and other assistive devices
10. Comply with quality control (QC) measures
11. Prepare patient for treatment
  - a. Body positioning
  - b. Confirm facility provided clothing (cotton or other approved material)

- c. Age specific patient education on fundamentals of HBO treatment; equalizing ear pressure
- d. Provide patient comfort measures
- e. Complete the required Authorization Form for an otherwise prohibited items use

#### Generalized Clinical Knowledge

A basic understanding of hyperbaric risks, side effects and hazards of certain medications.

1. Maintain BLS; ability to establish an airway (per scope of practice)
2. Describe the signs, symptoms and immediate management of hyper- and hypothermia
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. Communication with all members of the hyperbaric team
6. Reinforce age-specific teaching
7. Perform transcutaneous oximetry (TCOM) testing, as ordered
8. Basic medical terminology
9. Proper use and application of restraints when ordered by physician; assess circulation
10. Patient privacy and confidentiality; observe HIPAA requirements
11. Medical record keeping

#### Infection Control Measures

1. Standard precautions
2. Use of approved disinfectants for chamber and equipment; recognizing risks associated with off gassing of chemicals in the chamber. Methods and frequency
3. Hand washing with alcohol free approved product(s)
4. Personal protective equipment (PPE)

## Clinical Internship in Hyperbaric Technology

### Introduction

To facilitate entry for certification in hyperbaric technology, the National Board of Diving & 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 a Certified Hyperbaric Technologist® or a Certified Hyperbaric Registered Nurse® with a minimum of two (2) years of undersea/clinical hyperbaric/aviation medicine experience. The Board must be notified in writing ([https://nbdhmt.org/wp-content/uploads/2023/01/CHT\\_Preceptor\\_Form.pdf](https://nbdhmt.org/wp-content/uploads/2023/01/CHT_Preceptor_Form.pdf)) of the name of the preceptor 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. Each center is encouraged to develop specific training material with regard to precise objectives, subject matter and teaching methods.

## Chamber Equipment

### 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 a 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 multiplace chambers, and both oxygen and compressed air in monoplace 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 Systems

**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. Perform and document safety drills.

**Additional Objectives:** Inspect the 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), including a working knowledge of decompression procedures and all hyperbaric treatment protocols.

**Additional Objectives:** Demonstrate a working knowledge of U.S. Navy air decompression table computations.

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 monitor; Ambu bag etc.). Know all 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 patients into and 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.

## **Safety**

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.

Conduct pre-treatment safety "time out" inspection.

Undertake chamber and monoplace chamber patient grounding checks.

Know how to control oxygen levels in Class A chambers 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 set-up and connection of all pass-throughs. Know all 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 appropriate referable conditions for hyperbaric medicine evaluation and the related beneficial mechanism(s). Know the currently

accepted Undersea and Hyperbaric Medical Society approved hyperbaric treatment protocols. 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 reasons for referral, previous medical management, physical, neurological and vascular examinations. Assist in transcutaneous oxygen testing, review results and physician/provider interpretation. Formulate and rationalize a treatment plan.

#### 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, 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 doses of oxygen.

**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 doses of oxygen.

#### 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. Understand methods of determining blood glucose and options to correct 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 wave forms, if ECG monitoring is used.

#### Infection Control

**Internship Objectives:** Know and demonstrate knowledge of standard 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. Adjusting monoplace chamber oxygen flow rate for thermal comfort.

#### 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 (per scope of practice). Assess hyperbaric safety of various wound dressings.

#### Documentation

**Internship Objectives:** Know and demonstrate knowledge of all forms and Electronic Health Records used to document patient treatment.

**Additional Objectives:** Complete pre-treatment patient assessment. Complete ancillary patient chart notes and post-treatment documentation.

## Transcutaneous Oxygen (TCOM) Monitoring Module

### Background

CHT®'s are occasionally called upon to conduct transcutaneous oximetry testing. Commonly, this involves patients with lower extremity healing deficiencies. Tissue oximetry testing is a non-invasive and quantitative assessment of oxygen availability in tissues directly beneath the sensor electrode. Used in an algorithmic manner, transcutaneous oxygen testing:

- Identifies whether local hypoxia is a factor in healing compromise
- Determines the physiological capacity to respond locally (the wound) to centrally (the lungs) delivered increases in oxygen delivery
- Guides selection of hyperbaric treatment pressure
- Provides an early indication of therapeutic response
- Helps to identify a therapeutic end point

### Purpose

The TCOM Module is designed to ensure that CHT®'s are provided with sufficient knowledge and skill to effectively undertake transcutaneous oxygen data collection. This module contains both learning objectives and methods to demonstrate competency.

### Learning Objectives

The trainee is expected to be able to demonstrate a working knowledge of:

- I. Transcutaneous oxygen (tcpO<sub>2</sub>) technology
  - A. Principals of transcutaneous oximetry
  - B. Applications for transcutaneous oximetry
- II. Transcutaneous oxygen monitors and related equipment
  - A. Operating functions of the monitors
  - B. Calibration and calibration verification procedures
  - C. Sensor electrode care and maintenance
  - D. Membrane care and replacement
  - E. Monitor care
  - F. Operational troubleshooting
- III. The transcutaneous oxygen testing procedure
  - A. Patient consent
  - B. Site selection
  - C. Site preparation
  - D. Anticipated normal values
  - E. Control/reference sites
  - F. Normobaric air breathing
  - G. Normobaric oxygen breathing
  - H. Hyperbaric oxygen breathing
  - I. Documentation and data recording
  - J. Regional perfusion index (RPI) computation
  - K. Common testing errors

### RECOMMENDED READING

1. Fife CF, Smart DR, Sheffield PJ, et al. **Transcutaneous Oximetry in Clinical Practice. Consensus Statements Based on Evidence.** *Undersea Hyperbaric Medicine* 2009; 36(1):43-53.
2. Clarke RE. **Transcutaneous Oximetry Optimizes Clinical Management and Cost-Effectiveness of Diabetic Foot Ulcers Treated with Hyperbaric Oxygen: A Review of Point-of-Care Vascular Screening Options.** *Undersea Hyperbaric Medicine* 2025;52(4):521-535

3. Manufacturer's Transcutaneous Oxygen Monitor Operations Manual.

**CHT® 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 operational application of undersea, hyperbaric or aviation medicine.

A test bank of several hundred questions is accessed to develop each applicant's examination. The bank is monitored regularly and updated as indicated. A concerted effort has been made to ensure little or no bias regarding each examinee's background, be it multiplace or monoplace, civilian or military. There will be questions that relate to a specific hyperbaric setting; however, one's strengths should compensate for any weaknesses. Due to the breadth of this discipline no one is expected to have a complete and comprehensive knowledge of all hyperbaric-hypobaric operating systems. 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. The examination is taken online, involves 120 questions and has a limit of two hours. Questions are either multiple choice or true-false.

Examinations are scheduled at recognized testing centers in close geographic proximity to each individual examinee. Plan to arrive at the test site at least 15 minutes prior to your scheduled examination time. Government issued photographic identification is required to enter the testing area. A simple (non-memory storing) calculator may be helpful. Mobile phones are not permitted within the testing center. A set of US Navy Air Decompression Tables and scratch paper will be provided.

**Certification**

Examination Registration

Applicants must complete a NBDHMT Certification Examination Registration Form (available at [www.ndbhmt.org](http://www.ndbhmt.org)) and return it to NBDHMT headquarters along with the following:

1. A copy of an NBDHMT approved Introductory Hyperbaric Medicine Training Course certificate of completion.
2. A copy of qualifying vocation license or certificate.
3. Upon completion of an NBDHMT approved hyperbaric training course, CHT® applicants must undergo an internship of a minimum of 480 hours relating to undersea, hyperbaric medicine or aviation medicine technology, operations and safety. Forty (40) of these hours must be directly supervised. The Board must be notified in writing of the name of the supervising preceptor prior to commencing the internship. The preceptor should be a CHT® or a CHRN® with a minimum of two years' experience.
4. Payment of US\$175.00.
5. A completed 'Code of Conduct' declaration.
6. If special accommodation arrangements are required for documented disabilities or underlying medical condition, this should be noted in the space provided on the examination application form. Failure to indicate a special need may impact your ability to be appropriately accommodated at the time of testing.

Expiration Date

Certification is awarded for a period of two 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 2022 will have an expiration date of May 31, 2024. 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 NBDHMT Certified Hyperbaric Technologist® Recertification Form ([www.nbdhmt.org](http://www.nbdhmt.org)) and return to NBDHMT headquarters, along with the following:

1. Proof of a minimum of 24 (minimum of 12 Category “A”) CEU hours during the prior two (2) years.
2. Verify a minimum of 100 clinical work hours via the Certified Hyperbaric Technologist Recertification Verification Letter.

### **Continuing Education Requirements**

A minimum of 24 hours of continuing education credits (hours) is required during each re-certification period. Ideally all, but at least 12 should be Category A, defined as education and training directed related to technical, operations and safety aspects of hyperbaric or hypobaric operations. Examples of other suitable Category A topics include infection control/universal precautions, recognition and immediate management of barotrauma, recognition and immediate management of CNS oxygen toxicity, other chamber related complications, tissue oximetry testing, and inside attendant duties and decompression procedures. Credits may be earned through attendance at meetings and conferences approved by the NBDHMT. They can also be earned through NBDHMT approved employer initiatives directed at maintenance and updating of knowledge and skills. Online Category A approved credit opportunities exist, and details are available from Board headquarters. Retroactive Continuing Educations Applications and a sample continuing education log are available at [www.nbdhmt.org/cht.asp](http://www.nbdhmt.org/cht.asp).

If access to 24 Category A credits is not possible, the balance beyond 12 can be made up with Category B credits. They are defined as courses, programs and other learning opportunities related to allied health professional knowledge and skills in general and the clinical and compliant practice of undersea, hyperbaric or hypobaric medicine. Examples include clinical assessment and case management of the hyperbaric referral, emerging technologies, potential new uses of the hyperbaric chamber, related compliance expectations and standards, and BLS/ACLS/PALS certification/recertification. A CHT® who is formally present at meetings where CEU’s are offered are eligible for credits. For participation in development of a Poster Presentation, the NBDHMT will award two (2) credits (A or B depending upon the topic). Oral presentations, regardless of length, earn six (6) A or B credits. For those who serve as Hyperbaric Facility Accreditation Surveyors, the NBDHMT allows a one-time award of five (5) Category A credits, upon receipt of supporting documentation from the accrediting organization.

### **Failure to Recertify**

A CHT® who fails to recertify upon completion of any two-year certification period has a 12-month grace period. Application for recertification within this grace period will incur a \$100.00 penalty, in addition to the \$100.00 recertification payment. All the application requirements noted above for regular CHT® recertification will apply.

Those who fail to recertify within the 12-month grace period are extended one remaining option, providing that they have maintained active certification or licensure in their qualifying pathway. In these cases, the applicant will be required to re-take the CHT® 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 their qualifying pathway do not have the option to recertify following expiration of their grace period. They will be required to apply for certification as an entirely new applicant, as will all those whose CHT lapsed beyond the two-year period from their initial respective recertification dates. **This process includes successful completion of an NBDHMT approved hyperbaric training course within the previous two years of the re-application date.**

#### **Application for CHT-ADMIN**

The CHT-ADMIN designation is possible only at the time of recertification. The requirement to show proof of 12 CEU hours and verification of 100 clinical work hours is waived for this designation. CHT-ADMIN applicants must provide a copy of their resume/C.V.

The purpose of the CHT-ADMIN designation is to allow a CHT<sup>®</sup> to continue to use their CHT<sup>®</sup> designation once they have moved on from operational duties. Commonly, these individuals have moved into a management or administrative role. **The CHT ADMIN designation carries with it no ongoing operational intent.**

By applying for CHT-ADMIN, individuals can maintain their CHT<sup>®</sup> 'identity' and continue to be recognized as a hyperbaric professional.

For those who desire reinstatement as a practicing CHT<sup>®</sup> several pathways are available.

1. 0-2 years as a CHT-A

\$50.00 reinstatement fee and \$150.00 re-certification fee  
\$25.00 background check fee  
Proof of 24 hours continuing education (minimum 12 Cat. A)  
Letter of support from facility medical/program director

2. 2-4 years as a CHT-A

\$50.00 reinstatement fee and \$150.00 re-certification fee  
\$25.00 background check fee  
Proof of 24 hours continuing education (minimum 12 Cat. A)  
Letter of support from facility medical/program director  
40-hour preceptorship

3. > 4 years as a CHT-A

\$50.00 reinstatement fee and \$150.00 re-certification fee  
\$25.00 background check fee  
Proof of 24 hours continuing education (minimum 12 Cat. A)  
Letter of support from medical/program director  
480-hour internship (including 40 hours preceptorship)  
Re-test

#### **Failing and Retaking the Exam**

- If the first attempt is unsuccessful (a score of less than 70%) the applicant must wait at least three (3) months before retaking the exam.
- If the second attempt is also unsuccessful another three (3) month wait is again required, the applicant must also retake a NBDHMT approved hyperbaric medicine training course and repeat the internship/preceptorship before a third attempt.

#### **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; current edition
2. Hyperbaric Facility Safety: A Practical Guide. Best Publishing Company; current edition
3. Hyperbaric Oxygen Therapy Indications, 2019; 14<sup>th</sup> Edition. Undersea and Hyperbaric Medical Society.

4. Hyperbaric Medicine Practice, 4<sup>th</sup> Edition, 2017. Kindwall EP and Whelan HT, Editors. Best Publishing Company. ISBN: 978-1-947239-005.

In addition to the above materials a study guide is available. It can be obtained as follows:

CHT<sup>®</sup> and CHRN<sup>®</sup> Certification Exam Practice Book, available at [www.hyperbaricmedicine.com](http://www.hyperbaricmedicine.com).

## **Disciplinary Procedures**

### **NBDHMT Standards**

The NBDHMT 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 NBDHMT, including the requirements of the CHT<sup>®</sup> Code of Conduct.
2. The NBDHMT certificates, cards, logos, emblems, the name “National Board of Diving & 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.
3. 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.
4. 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.

### **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 adequate reason to question its validity. Before exercising this right, the Board will offer the individual an opportunity to take the exam again at no additional fee.

### **Review of Certificate**

#### **Violations**

The Board may revoke or otherwise act regarding 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 and CHT® Code of Conduct**

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

1. The applicable rule(s).
2. A statement of facts constituting the alleged violation of the rule(s),
3. That the individual may request a hearing for the disposition of the allegations, with the individual bearing their own expenses for such matter.
4. That the individual shall have 30 days after receiving 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.
5. 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.
6. That the truth of allegations or failure to respond may result in sanctions including certification revocation; and
7. That if the individual does not request a hearing, the individual consents that the Board may render a decision and apply available sanctions.

**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 President 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 hearing can be conducted by either a telephone or video conference call.
3. The Hearing Panel shall consist of three members of the Board of Directors of NBDHMT.

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. Reprimand
2. Censure
3. Suspension
4. Non-renewal
5. Revocation
6. Retest
7. Educational requirement

### **Appeal**

1. If the decision made 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 NBDHMT 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**

Individuals concerned with possible violations of Board standards should submit such information in writing. This information should identify the person's 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 whose knowledge of the facts and circumstances may have concerned the alleged conduct.

### **Position on Issued Credentials**

NBDHMT credentials must be used correctly. Titles and credentials are registered trademarks issued to the NBDHMT by the U.S. Patent and Trademark Office. They can only be used when authorized and for a period specifically designated by the NBDHMT. In addition, guidelines exist for displaying credentials correctly. For display of proper and improper use, the Certified Hyperbaric Technologist® (CHT®) is used below but applies to all certifications issued by the NBDHMT.

#### *Examples of correct CHT® use*

- John P. Doe, CHT
- John P. Doe, Certified Hyperbaric Technologist
- John P. Doe, CHT-ADMIN
- John P. Doe, Certified Hyperbaric Technologist-ADMIN

The credential may be used only for the period for which use is authorized. Use expires if renewal fees go unpaid and/or recertification requirements are not met. Use of these titles beyond the authorized period constitutes unauthorized use.

Credentials may be used on business cards, a resume, curriculum vitae, social media, and correspondence with a signature block. Credentials are awarded to individuals, not to companies or organizations, and should only be used with an individual's name.

*Example of proper company/organization use*

- XXX provides advanced wound care and hyperbaric services. Employees holding the Certified Hyperbaric Technologist (CHT®) certification include John P. Doe, CHT, and Mary P. Jones, CHRN.

*Example of improper company use*

- XXX provides advanced wound care and hyperbaric services by Certified Hyperbaric Technologists.

*Retired Credential Holders*

Individuals who retire can hold their certification in retired status should they meet the following requirements:

- Held certification a minimum of 10-years
- Completed two (2) recertification cycles

*To maintain certification in retired status*

- Accrue no more than 40 hours of annual operational practice
- Payment of a biannual renewal fee of \$10

*Individuals holding a certification in retired status must indicate their status using any of the following examples*

- John P. Doe, CHT Retired
- John P. Doe, CHT (Retired)
- John P. Doe, CHT Ret.
- John P. Doe, Certified Hyperbaric Technologist (Retired)

*Use of NBDHMT credentials without authority*

The NBDHMT has established procedures for investigating individuals, companies and organizations who appear to be using a NBDHMT credential without authorization. The identity of anyone reporting potential violations will remain confidential.

Unauthorized use may occur online, on a business card, resume, curriculum vitae, business letterhead, brochure, or similar publication, or within a signature block.

After receiving notification of potential unauthorized use, the NBDHMT will undertake steps to determine any irregularities, which may include legal counsel.

Those who have used NBDHMT credentials without authority may be barred from pursuing NBDHMT certification for up to five (5) years. Their names may be published on the board's website. The NBDHMT reserves the right to use the legal system to protect its trademarks.