



# DISCOVER SCUBA® Diving

We are excited to offer the PADI Discover Scuba Diving Class (DSD) at Forestburg Scout Reservation this Summer. This class gives scouts an opportunity to experience scuba for the first time in a safe swimming pool environment supervised by a certified PADI Scuba Instructor. This class includes one afternoon briefing session which will last about 1 hour, and an evening session in the pool. The pool session will be approximately 45 minutes. Both the briefing and evening pool session are required. This program will be open to Scouts 12 and older. The cost of the class is \$30 and is non-refundable.

Anyone with the following medical conditions may NOT participate in the Discover Scuba Program at Forestburg:

- Anyone taking Medications for Seizure Control or has had a Seizure within the past 5 years
- Anyone using Insulin to Control Diabetes
- Anyone with Asthma or Reactive Airway Disease (RAD), unless they have been asymptomatic and medication free for the past 5 years as documented on the BSA Medical form

In order to participate, each scout would need to complete the DSD-PADI Medical Questionnaire and Acceptance of Risk form as well as the PADI Liability Release and Assumption of Risk Agreement. If any of the questions on the PADI Medical Questionnaire require an answer YES, then a PADI-RSTC Medical Statement will need to be completed by the Scout's Physician in addition to the BSA Medical Form. At minimum DSD-PADI Medical Questionnaire and Acceptance of Risk form as well as the PADI Liability Release and Assumption of Risk Agreement will need to be turned into Monmouth Council with the BSA Medical Form no later than two weeks prior to your arrival at camp. If a PADI-Medical form is required (as described above), it will need to be turned in along with both the DSD-PADI Medical Questionnaire and Acceptance of Risk form as well as the PADI Liability Release and Assumption of Risk Agreement and BSA Medical Form no later than two weeks prior to your arrival at camp. All forms must be filled out completely, accurately and according to the instructions.

Scenario 1 - Scout has to answer YES to any of the medical questions on the PADI Medical Questionnaire:

Two weeks prior to your arrival at camp, the scout will need to turn in the DSD-PADI Medical Questionnaire and Acceptance of Risk form, the PADI Liability Release and Assumption of Risk Agreement, The PADI-RSTC Medical Statement form and the BSA Medical Form

Scenario 2 - Scout **does not** have to answer YES to any of the medical questions on the DSD-PADI Medical-Questionnaire:

Two weeks prior to your arrival at camp, the scout will need to turn in the DSD-PADI Medical Questionnaire and Acceptance of Risk form, the PADI Liability Release and Assumption of Risk Agreement and the BSA Medical Form.

All Scouts taking this class will be required to come to the dining hall on Sunday for Add/Drop Merit Badge Signups in order to get scheduled for their session during the week. They will receive instructions at that time where they will meet for the class. There is a mandatory briefing that all scouts have to attend the same day of their evening pool session. This mandatory 1 hour briefing will take place at Thecker Lodge (camp office) at 1:15 PM. All Scuba Equipment will be provided for this class.

Scouts will need to wear their swim trunks and bring a towel to the evening pool session. The evening pool session will be held at the Forestburg Town Hall Pool. Transportation to the pool may be required by troop leadership.

**PADI Discover Scuba Diving Class requires scouts to be pre-signed up using code P2 on their personal program form and in the online reservation system.**



# LIABILITY RELEASE AND ASSUMPTION OF RISK AGREEMENT

Please read carefully and fill in all blanks before signing.

I, \_\_\_\_\_, hereby affirm that I am aware that skin and scuba diving have inherent risks which may result in serious injury or death.

Participant Name

I understand that diving with compressed air involves certain inherent risks; decompression sickness, embolism or other hyperbaric injury can occur that require treatment in a recompression chamber. I further understand that the open water diving trips which are necessary for training and for certification, may be conducted at a site that is remote, either by time or distance or both, from such a recompression chamber. I still choose to proceed with such instructional dives in spite of the possible absence of a recompression chamber in proximity to the dive site.

I understand and agree that neither my instructor(s), \_\_\_\_\_ the facility through which I receive my instruction, \_\_\_\_\_, nor International PADI, Inc., nor its affiliate and subsidiary corporations, nor any of their respective employees, officers, agents, contractors or assigns, (hereinafter referred to as "Released Parties") may be held liable or responsible in any way for any injury, death, or other damages to me, my family, estate, heirs or assigns that may occur as a result of my participation in this diving program or as a result of the negligence of any party, including the Released Parties, whether passive or active.

Staff of a Divers Two

Divers Two

In consideration of being allowed to participate in this course (and optional Adventure Dive hereinafter referred to as "program"), I hereby personally assume all risks of this program, whether foreseen or unforeseen, that may befall me while I am a participant in this program, including but not limited to the academics, confined water and/or open water activities.

I further release, exempt and hold harmless said program and Released Parties from any claim or lawsuit by me, my family, estate, heirs, or assigns, arising out of my enrollment and participation in this program including both claims arising during the program or after I receive my certification.

I also understand that skin diving and scuba diving are physically strenuous activities and that I will be exerting myself during this diving program, and that if I am injured as a result of a heart attack, panic, hyperventilation, drowning or any other cause, that I expressly assume the risk of said injuries and that I will not hold the Released Parties responsible for the same.

I further state that I am of lawful age and legally competent to sign this liability release, or that I have acquired the written consent of my parent or guardian.

I understand the terms herein are contractual and not a mere recital, and that I have signed this document of my own free act and with the knowledge that I hereby agree to waive my legal rights. I further agree if any provision of this Agreement is found to be unenforceable or invalid, that provision shall be severed from this Agreement. The remainder of this Agreement will then be construed as though the unenforceable provision had never been contained herein.

I, \_\_\_\_\_ BY THIS INSTRUMENT AGREE TO EXEMPT AND RELEASE MY

Participant Name

INSTRUCTORS, \_\_\_\_\_, THE FACILITY THROUGH WHICH I RECEIVE

Staff of Divers Two

MY INSTRUCTION, \_\_\_\_\_, AND INTERNATIONAL PADI, INC., AND ALL RELATED ENTITIES AS DEFINED ABOVE, FROM ALL LIABILITY OR RESPONSIBILITY WHATSOEVER FOR PERSONAL INJURY, PROPERTY DAMAGE OR WRONGFUL DEATH HOWEVER CAUSED, INCLUDING, BUT NOT LIMITED TO, THE NEGLIGENCE OF THE RELEASED PARTIES, WHETHER PASSIVE OR ACTIVE.

Divers Two

I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS LIABILITY RELEASE AND ASSUMPTION OF RISK AGREEMENT BY READING IT BEFORE I SIGNED IT ON BEHALF OF MYSELF AND MY HEIRS.

Participant's Signature

Date (Day/Month/Year)

Signature of Parent or Guardian (where applicable)

Date (Day/Month/Year)

# PADI Discover Scuba® Diving Participant Statement

Read the following paragraphs carefully.

This statement, which includes a Medical Questionnaire, a Liability Release and Assumption of Risk Agreement (Statement of Risks and Liability), Non-Agency Disclosure and Acknowledgment and the Discover Scuba Diving Knowledge and Safety Review, informs you of some potential risks involved in scuba diving and of the conduct required of you during the PADI Discover Scuba Diving program. If you are a minor, your parent or guardian must read this Guide and sign on the back panel.

You will also need to learn important safety rules regarding breathing and equalization while scuba diving from the PADI Professional. Scuba diving and the use of scuba equipment without proper supervision or instruction can result in serious injury or death. You must be instructed in its use under the direct supervision of a qualified instructor.



## PADI Medical Questionnaire

Scuba diving is an exciting and demanding activity. To scuba dive you must not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. All body air spaces must be normal and healthy. A person with heart trouble, a current cold or congestion, epilepsy, asthma, a severe medical problem, or who is under the influence of alcohol or drugs, should not dive. If taking medication, consult your doctor before participating in this program.

The purpose of the Medical Questionnaire is to find out if you should be examined by a physician before participating in recreational scuba diving. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a preexisting condition that may affect your safety while diving and you must seek the advice of a physician.

Please answer the following questions on your past and present medical history with a YES or NO. If you are not sure, answer YES. If any of these items apply to you, we must request that you consult with a physician prior to participating in scuba diving. Your PADI Professional will supply you with a PADI Medical Statement and Guidelines for Recreational Scuba Diver's Physical Examination to take to a physician.

- Do you currently have an ear infection?
- Do you have a history of ear disease, hearing loss or problems with balance?
- Do you have a history of ear or sinus surgery?
- Are you currently suffering from a cold, congestion, sinusitis or bronchitis?
- Do you have a history of respiratory problems, severe attacks of hayfever or allergies, or lung disease?
- Have you had a collapsed lung (pneumothorax) or history of chest surgery?
- Do you have active asthma or history of emphysema or tuberculosis?
- Are you currently taking medication that carries a warning about any impairment of your physical or mental abilities?
- Do you have behavioral health, mental or psychological problems or a nervous system disorder?
- Are you or could you be pregnant?
- Do you have a history of colostomy?
- Do you have a history of heart disease or heart attack, heart surgery or blood vessel surgery?
- Do you have a history of high blood pressure, angina, or take medication to control blood pressure?
- Are you over 45 and have a family history of heart attack or stroke?
- Do you have a history of bleeding or other blood disorders?
- Do you have a history of diabetes?
- Do you have a history of seizures, blackouts or fainting, convulsions or epilepsy or take medications to prevent them?
- Do you have a history of back, arm or leg problems following an injury, fracture or surgery?
- Do you have a history of fear of closed or open spaces or panic attacks (claustrophobia or agoraphobia)?

# Non-Agency Disclosure and Acknowledgment Agreement

I understand and agree that PADI Members ("Members"), including Monmouth Council, BSA and/or any individual PADI Instructors and Divemasters associated with the program in which I am participating, are licensed to use various PADI Trademarks and to conduct PADI training, but are not agents, employees or franchisees of PADI EMEA Ltd., PADI Americas, Inc., or its parent, subsidiary and affiliated corporations ("PADI"). I further understand that Member business activities are independent, and are neither owned nor operated by PADI, and that while PADI establishes the standards for PADI diver training programs, it is not responsible for, nor does it have the right to control, the operation of the Members' business activities and the day-to-day conduct of PADI programs and supervision of divers by the Members or their associated staff.

## Statement of Risk and Liability

This is a statement in which you are informed of the risks of skin and scuba diving. The statement also sets out the circumstances in which you participate in the diving programme at your own risk.

Your signature on this statement is required as proof that you have received and read this statement. It is important that you read the contents of this statement before signing it. If you do not understand anything contained in this statement, then please discuss it with your instructor. If you are a minor, this form must also be signed by a parent or guardian.

### Warning

Skin and scuba diving have inherent risks which may result in serious injury or death.

Diving with compressed air involves certain inherent risks; decompression sickness, embolism or other hyperbaric injury can occur that require treatment in a recompression chamber. Open water diving trips that are necessary for training and for certification, may be conducted at a site that is remote, either by time or distance or both, from such a recompression chamber. Skin and scuba diving are physically strenuous activities and you will be exerting yourself during this diving programme. You must advise truthfully and fully inform the dive professionals and the facility through which this programme is offered of your medical history.

## Acceptance of Risk

I understand and agree that neither the dive professionals conducting this programme, Staff of Forestburg Scout Reservation, nor the facility through which this programme is conducted, Monmouth Council, BSA, nor PADI EMEA Ltd., nor PADI Americas, Inc. nor their affiliate or subsidiary corporations, nor any of their respective employees, officers, agents, contractors or assigns accept any responsibility for any death, injury or other loss suffered by me to the extent that it result from my own conduct or any matter or condition under my control that amounts to my own contributory negligence.

In the absence of any negligence or other breach of duty by the dive professionals conducting this programme, Staff of Forestburg Scout Reservation, the facility through which this programme is offered, Monmouth Council, BSA, PADI EMEA Ltd., PADI Americas, Inc. and all parties referred to above, my participation in this diving programme is entirely at my own risk.

I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS NON-AGENCY DISCLOSURE AND ACKNOWLEDGMENT AGREEMENT AND STATEMENT OF RISK AND LIABILITY BY READING BOTH BEFORE SIGNING THESE STATEMENTS.

Participant Name (Please Print)

Participant Signature

Signature of Parent/Guardian (where applicable)

Date (Day/Month/Year)

Date (Day/Month/Year)



# MEDICAL STATEMENT

## Participant Record (Confidential Information)

**Please read carefully before signing.**

This is a statement in which you are informed of some potential risks involved in scuba diving and of the conduct required of you during the scuba training program. Your signature on this statement is required for you to participate in the scuba training program offered

by Staff of Forestburg Scout Reservation and  
Instructor

Monmouth Council, BSA located in the  
Facility

city of Morganville, state/province of New Jersey.

Read this statement prior to signing it. You must complete this Medical Statement, which includes the medical questionnaire section, to enroll in the scuba training program. If you are a minor, you must have this Statement signed by a parent or guardian.

Diving is an exciting and demanding activity. When performed correctly, applying correct techniques, it is relatively safe. When

established safety procedures are not followed, however, there are increased risks.

To scuba dive safely, you should not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. All body air spaces must be normal and healthy. A person with coronary disease, a current cold or congestion, epilepsy, a severe medical problem or who is under the influence of alcohol or drugs should not dive. If you have asthma, heart disease, other chronic medical conditions or you are taking medications on a regular basis, you should consult your doctor and the instructor before participating in this program, and on a regular basis thereafter upon completion. You will also learn from the instructor the important safety rules regarding breathing and equalization while scuba diving. Improper use of scuba equipment can result in serious injury. You must be thoroughly instructed in its use under direct supervision of a qualified instructor to use it safely.

If you have any additional questions regarding this Medical Statement or the Medical Questionnaire section, review them with your instructor before signing.

### Divers Medical Questionnaire

**To the Participant:**

The purpose of this Medical Questionnaire is to find out if you should be examined by your doctor before participating in recreational diver training. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a preexisting condition that may affect your safety while diving and you must seek the advice of your physician prior to engaging in dive activities.

- Could you be pregnant, or are you attempting to become pregnant?
- Are you presently taking prescription medications? (with the exception of birth control or anti-malarial)
- Are you over 45 years of age and can answer YES to one or more of the following?
  - currently smoke a pipe, cigars or cigarettes
  - have a high cholesterol level
  - have a family history of heart attack or stroke
  - are currently receiving medical care
  - high blood pressure
  - diabetes mellitus, even if controlled by diet alone

**Have you ever had or do you currently have...**

- Asthma, or wheezing with breathing, or wheezing with exercise?
- Frequent or severe attacks of hayfever or allergy?
- Frequent colds, sinusitis or bronchitis?
- Any form of lung disease?
- Pneumothorax (collapsed lung)?
- Other chest disease or chest surgery?
- Behavioral health, mental or psychological problems (Panic attack, fear of closed or open spaces)?
- Epilepsy, seizures, convulsions or take medications to prevent them?
- Recurring complicated migraine headaches or take medications to prevent them?
- Blackouts or fainting (full/partial loss of consciousness)?
- Frequent or severe suffering from motion sickness (seasick, carsick, etc.)?

Please answer the following questions on your past or present medical history with a **YES** or **NO**. If you are not sure, answer **YES**. If any of these items apply to you, we must request that you consult with a physician prior to participating in scuba diving. Your instructor will supply you with an RSTC Medical Statement and Guidelines for Recreational Scuba Diver's Physical Examination to take to your physician.

- Dysentery or dehydration requiring medical intervention?
- Any dive accidents or decompression sickness?
- Inability to perform moderate exercise (example: walk 1.6 km/one mile within 12 mins.)?
- Head injury with loss of consciousness in the past five years?
- Recurrent back problems?
- Back or spinal surgery?
- Diabetes?
- Back, arm or leg problems following surgery, injury or fracture?
- High blood pressure or take medicine to control blood pressure?
- Heart disease?
- Heart attack?
- Angina, heart surgery or blood vessel surgery?
- Sinus surgery?
- Ear disease or surgery, hearing loss or problems with balance?
- Recurrent ear problems?
- Bleeding or other blood disorders?
- Hernia?
- Ulcers or ulcer surgery ?
- A colostomy or ileostomy?
- Recreational drug use or treatment for, or alcoholism in the past five years?

**The information I have provided about my medical history is accurate to the best of my knowledge. I agree to accept responsibility for omissions regarding my failure to disclose any existing or past health condition.**

\_\_\_\_\_  
Signature Date Signature of Parent or Guardian Date

# STUDENT

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**Please print legibly.**

Name \_\_\_\_\_ Birth Date \_\_\_\_\_ Age \_\_\_\_\_  
First Initial Last Day/Month/Year

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State/Province/Region \_\_\_\_\_

Country \_\_\_\_\_ Zip/Postal Code \_\_\_\_\_

Home Phone ( ) \_\_\_\_\_ Business Phone ( ) \_\_\_\_\_

Email \_\_\_\_\_ FAX \_\_\_\_\_

## **Name and address of your family physician**

Physician \_\_\_\_\_ Clinic/Hospital \_\_\_\_\_

Address \_\_\_\_\_

Date of last physical examination \_\_\_\_\_

Name of examiner \_\_\_\_\_ Clinic/Hospital \_\_\_\_\_

Address \_\_\_\_\_

Phone ( ) \_\_\_\_\_ Email \_\_\_\_\_

Were you ever required to have a physical for diving?  Yes  No If so, when? \_\_\_\_\_

# PHYSICIAN

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This person applying for training or is presently certified to engage in scuba (self-contained underwater breathing apparatus) diving. Your opinion of the applicant's medical fitness for scuba diving is requested. There are guidelines attached for your information and reference.

## **Physician's Impression**

I find no medical conditions that I consider incompatible with diving.

I am unable to recommend this individual for diving.

**Remarks** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Physician's Signature or Legal Representative of Medical Practitioner Date Day/Month/Year

Physician \_\_\_\_\_ Clinic/Hospital \_\_\_\_\_

Address \_\_\_\_\_

Phone ( ) \_\_\_\_\_ Email \_\_\_\_\_

# Guidelines for Recreational Scuba Diver's Physical Examination

## Instructions to the Physician:

Recreational **SCUBA** (Self-Contained Underwater Breathing Apparatus) can provide recreational divers with an enjoyable sport safer than many other activities. The risk of diving is increased by certain physical conditions, which the relationship to diving may not be readily obvious. Thus, it is important to screen divers for such conditions.

The **RECREATIONAL SCUBA DIVER'S PHYSICAL EXAMINATION** focuses on conditions that may put a diver at increased risk for decompression sickness, pulmonary overinflation syndrome with subsequent arterial gas embolization and other conditions such as loss of consciousness, which could lead to drowning. Additionally, the diver must be able to withstand some degree of cold stress, the physiological effects of immersion and the optical effects of water and have sufficient physical and mental reserves to deal with possible emergencies.

The history, review of systems and physical examination should include as a minimum the points listed below. The list of conditions that might adversely affect the diver is not all-inclusive, but contains the most commonly encountered medical problems. The brief introductions should serve as an alert to the nature of the risk posed by each medical problem.

The potential diver and his or her physician must weigh the pleasures to be had by diving against an increased risk of death or injury due to the individual's medical condition. As with any recreational activity, there are no data for diving enabling the calculation of an accurate mathematical probability of injury. Experience and physiological principles only permit a qualitative assessment of relative risk.

For the purposes of this document, **Severe Risk** implies that an individual is believed to be at substantially elevated risk of decompression sickness, pulmonary or otic barotrauma or altered consciousness with subsequent drowning, compared with the general population. The consultants involved in drafting this document would generally discourage a student with such medical problems from diving. **Relative Risk** refers to a moderate increase in risk, which in some instances may be acceptable. To make a decision as to whether diving is contraindicated for this category of medical problems, physicians must base their judgement on an assessment of the individual patient. Some medical problems which may preclude diving are **temporary** in nature or responsive to treatment, allowing the student to dive safely after they have resolved.

Diagnostic studies and specialty consultations should be obtained as indicated to determine the diver's status. A list of references is included to aid in clarifying issues that arise. Physicians and other medical professionals of the Divers Alert Network (DAN) associated with Duke University Health System are available for consultation by phone +1 919 684 2948 during normal business hours. For emergency calls, 24 hours 7 days a week, call +1 919 684 8111 or +1 919 684 4DAN (collect). Related organizations exist in other parts of the world – DAN Europe in Italy +39 039 605 7858, DAN S.E.A.P. in Australia +61 3 9886 9166 and Divers Emergency Service (DES) in Australia +61 8 8212 9242, DAN Japan +81 33590 6501 and DAN Southern Africa +27 11 242 0380. There are also a number of informative websites offering similar advice.

## NEUROLOGICAL

Neurological abnormalities affecting a diver's ability to perform exercise should be assessed according to the degree of compromise. Some diving physicians feel that conditions in which there can be a waxing and waning of neurological symptoms and signs, such as migraine or demyelinating disease, contraindicate diving because an exacerbation or attack of the preexisting disease (e.g.: a migraine with aura) may be difficult to distinguish

from neurological decompression sickness. A history of head injury resulting in unconsciousness should be evaluated for risk of seizure.

### Relative Risk Conditions

- **Complicated Migraine Headaches whose symptoms or severity impair motor or cognitive function, neurologic manifestations**
- **History of Head Injury with sequelae other than seizure**
- **Herniated Nucleus Pulposus**
- **Intracranial Tumor or Aneurysm**
- **Peripheral Neuropathy**
- **Multiple Sclerosis**
- **Trigeminal Neuralgia**
- **History of spinal cord or brain injury**

### Temporary Risk Condition

**History of cerebral gas embolism without residual where pulmonary air trapping has been excluded and for which there is a satisfactory explanation and some reason to believe that the probability of recurrence is low.**

### Severe Risk Conditions

Any abnormalities where there is a significant probability of unconsciousness, hence putting the diver at increased risk of drowning. Divers with spinal cord or brain abnormalities where perfusion is impaired may be at increased risk of decompression sickness.

### Some conditions are as follows:

- **History of seizures other than childhood febrile seizures**
- **History of Transient Ischemic Attack (TIA) or Cerebrovascular Accident (CVA)**
- **History of Serious (Central Nervous System, Cerebral or Inner Ear) Decompression Sickness with residual deficits**

## CARDIOVASCULAR SYSTEMS

### Relative Risk Conditions

The diagnoses listed below potentially render the diver unable to meet the exertional performance requirements likely to be encountered in recreational diving. These conditions may lead the diver to experience cardiac ischemia and its consequences. Formalized stress testing is encouraged if there is any doubt regarding physical performance capability. The suggested minimum criteria for stress testing in such cases is at least 13 METS.\* Failure to meet the exercise criteria would be of significant concern. Conditioning and retesting may make later qualification possible. Immersion in water causes a redistribution of blood from the periphery into the central compartment, an effect that is greatest in cold water. The marked increase in cardiac preload during immersion can precipitate pulmonary edema in patients with impaired left ventricular function or significant valvular disease. The effects of immersion can mostly be gauged by an assessment of the diver's performance while swimming on the surface. A large proportion of scuba diving deaths in North America are due to coronary artery disease. Before being approved to scuba dive, individuals older than 40 years are recommended to undergo risk assessment for coronary artery disease. Formal exercise testing may be needed to assess the risk.

\* METS is a term used to describe the metabolic cost. The MET at rest is one, two METS is two times the resting level, three METS is three times the resting level, and so on. The resting energy cost (net oxygen requirement) is thus standardized. (Exercise Physiology; Clark, Prentice Hall, 1975.)

## Relative Risk Conditions

- History of Coronary Artery Bypass Grafting (CABG)
- Percutaneous Balloon Angioplasty (PCTA) or Coronary Artery Disease (CAD)
- History of Myocardial Infarction
- Congestive Heart Failure
- Hypertension
- History of dysrhythmias requiring medication for suppression
- Valvular Regurgitation

## Pacemakers

The pathologic process that necessitated should be addressed regarding the diver's fitness to dive. In those instances where the problem necessitating pacing does not preclude diving, will the diver be able to meet the performance criteria?

\* NOTE: Pacemakers must be certified by the manufacturer as able to withstand the pressure changes involved in recreational diving.

## Severe Risks

Venous emboli, commonly produced during decompression, may cross major intracardiac right-to-left shunts and enter the cerebral or spinal cord circulations causing neurological decompression illness. Hypertrophic cardiomyopathy and valvular stenosis may lead to the sudden onset of unconsciousness during exercise.

## PULMONARY

Any process or lesion that impedes airflow from the lungs places the diver at risk for pulmonary overinflation with alveolar rupture and the possibility of cerebral air embolization. Many interstitial diseases predispose to spontaneous pneumothorax: Asthma (reactive airway disease), Chronic Obstructive Pulmonary Disease (COPD), cystic or cavitating lung diseases may all cause air trapping. The 1996 Undersea and Hyperbaric Medical Society (UHMS) consensus on diving and asthma indicates that for the risk of pulmonary barotrauma and decompression illness to be acceptably low, the asthmatic diver should be asymptomatic and have normal spirometry before and after an exercise test. Inhalation challenge tests (e.g.: using histamine, hypertonic saline or methacholine) are not sufficiently standardized to be interpreted in the context of scuba diving.

A pneumothorax that occurs or reoccurs while diving may be catastrophic. As the diver ascends, air trapped in the cavity expands and could produce a tension pneumothorax.

In addition to the risk of pulmonary barotrauma, respiratory disease due to either structural disorders of the lung or chest wall or neuromuscular disease may impair exercise performance. Structural disorders of the chest or abdominal wall (e.g.: prune belly), or neuromuscular disorders, may impair cough, which could be life threatening if water is aspirated. Respiratory limitation due to disease is compounded by the combined effects of immersion (causing a restrictive deficit) and the increase in gas density, which increases in proportion to the ambient pressure (causing increased airway resistance). Formal exercise testing may be helpful.

## Relative Risk Conditions

- History of Asthma or Reactive Airway Disease (RAD)\*
- History of Exercise Induced Bronchospasm (EIB)\*
- History of solid, cystic or cavitating lesion\*
- Pneumothorax secondary to:
  - Thoracic Surgery
  - Trauma or Pleural Penetration\*
  - Previous Overinflation Injury\*

- Obesity
- History of Immersion Pulmonary Edema Restrictive Disease\*
- Interstitial lung disease: May increase the risk of pneumothorax

\* Spirometry should be normal before and after exercise

Active Reactive Airway Disease, Active Asthma, Exercise Induced Bronchospasm, Chronic Obstructive Pulmonary Disease or history of same with abnormal PFTs or a positive exercise challenge are concerns for diving.

## Severe Risk Conditions

- History of spontaneous pneumothorax. Individuals who have experienced spontaneous pneumothorax should avoid diving, even after a surgical procedure designed to prevent recurrence (such as pleurodesis). Surgical procedures either do not correct the underlying lung abnormality (e.g.: pleurodesis, apical pleurectomy) or may not totally correct it (e.g.: resection of blebs or bullae).
- Impaired exercise performance due to respiratory disease.

## GASTROINTESTINAL

### Temporary Risks

As with other organ systems and disease states, a process which chronically debilitates the diver may impair exercise performance. Additionally, dive activities may take place in areas remote from medical care. The possibility of acute recurrences of disability or lethal symptoms must be considered.

### Temporary Risk Conditions

- Peptic Ulcer Disease associated with pyloric obstruction or severe reflux
- Unrepaired hernias of the abdominal wall large enough to contain bowel within the hernia sac could incarcerate.

### Relative Risk Conditions

- Inflammatory Bowel Disease
- Functional Bowel Disorders

### Severe Risks

Altered anatomical relationships secondary to surgery or malformations that lead to gas trapping may cause serious problems. Gas trapped in a hollow viscous expands as the divers surfaces and can lead to rupture or, in the case of the upper GI tract, emesis. Emesis underwater may lead to drowning.

### Severe Risk Conditions

- Gastric outlet obstruction of a degree sufficient to produce recurrent vomiting
- Chronic or recurrent small bowel obstruction
- Severe gastroesophageal reflux
- Achalasia
- Paraesophageal Hernia

## ORTHOPAEDIC

Relative impairment of mobility, particularly in a boat or ashore with equipment weighing up to 18 kgs/40 pounds must be assessed. Orthopaedic conditions of a degree sufficient to impair exercise performance may increase the risk.

### Relative Risk Conditions

- Amputation
- Scoliosis must also assess impact on respiratory function and exercise performance.
- Aseptic Necrosis possible risk of progression due to effects of decompression (evaluate the underlying medical

cause of decompression may accelerate/escalate the progression).

### **Temporary Risk Conditions**

- Back pain

## **HEMATOLOGICAL**

Abnormalities resulting in altered rheological properties may theoretically increase the risk of decompression sickness. Bleeding disorders could worsen the effects of otic or sinus barotrauma, and exacerbate the injury associated with inner ear or spinal cord decompression sickness. Spontaneous bleeding into the joints (e.g.: in hemophilia) may be difficult to distinguish from decompression illness.

### **Relative Risk Conditions**

- Sickle Cell Disease
- Polycythemia Vera
- Leukemia
- Hemophilia/Impaired Coagulation

## **METABOLIC AND ENDOCRINOLOGICAL**

With the exception of diabetes mellitus, states of altered hormonal or metabolic function should be assessed according to their impact on the individual's ability to tolerate the moderate exercise requirement and environmental stress of sport diving. Obesity may predispose the individual to decompression sickness, can impair exercise tolerance and is a risk factor for coronary artery disease.

### **Relative Risk Conditions**

- Hormonal Excess or Deficiency
- Obesity
- Renal Insufficiency

### **Severe Risk Conditions**

The potentially rapid change in level of consciousness associated with hypoglycemia in diabetics on insulin therapy or certain oral hypoglycemic medications can result in drowning. Diving is therefore generally contraindicated, unless associated with a specialized program that addresses these issues. [See "Guidelines for Recreational Diving with Diabetes" at [www.wrsc.com](http://www.wrsc.com) and [www.diversalertnetwork.org](http://www.diversalertnetwork.org).]

**Pregnancy:** The effect of venous emboli formed during decompression on the fetus has not been thoroughly investigated. Diving is therefore not recommended during any stage of pregnancy or for women actively seeking to become pregnant.

## **BEHAVIORAL HEALTH**

Behavioral: The diver's mental capacity and emotional make-up are important to safe diving. The student diver must have sufficient learning abilities to grasp information presented to him by his instructors, be able to safely plan and execute his own dives and react to changes around him in the underwater environment. The student's motivation to learn and his ability to deal with potentially dangerous situations are also crucial to safe scuba diving.

### **Relative Risk Conditions**

- Developmental delay
- History of drug or alcohol abuse
- History of previous psychotic episodes
- Use of psychotropic medications

### **Severe Risk Conditions**

- Inappropriate motivation to dive – solely to please spouse, partner or family member, to prove oneself in the face of

personal fears

- Claustrophobia and agoraphobia
- Active psychosis
- History of untreated panic disorder
- Drug or alcohol abuse

## **OTOLARYNGOLOGICAL**

Equalisation of pressure must take place during ascent and descent between ambient water pressure and the external auditory canal, middle ear and paranasal sinuses. Failure of this to occur results at least in pain and in the worst case rupture of the occluded space with disabling and possible lethal consequences.

The inner ear is fluid filled and therefore noncompressible. The flexible interfaces between the middle and inner ear, the round and oval windows are, however, subject to pressure changes. Previously ruptured but healed round or oval window membranes are at increased risk of rupture due to failure to equalise pressure or due to marked overpressurisation during vigorous or explosive Valsalva manoeuvres.

The larynx and pharynx must be free of an obstruction to airflow. The laryngeal and epiglottic structure must function normally to prevent aspiration.

Mandibular and maxillary function must be capable of allowing the patient to hold a scuba mouthpiece. Individuals who have had mid-face fractures may be prone to barotrauma and rupture of the air filled cavities involved.

### **Relative Risk Conditions**

- Recurrent otitis externa
- Significant obstruction of external auditory canal
- History of significant cold injury to pinna
- Eustachian tube dysfunction
- Recurrent otitis media or sinusitis
- History of TM perforation
- History of tympanoplasty
- History of mastoidectomy
- Significant conductive or sensorineural hearing impairment
- Facial nerve paralysis not associated with barotrauma
- Full prosthodontic devices
- History of mid-face fracture
- Unhealed oral surgery sites
- History of head and/or neck therapeutic radiation
- History of temporomandibular joint dysfunction
- History of round window rupture

### **Severe Risk Conditions**

- Monomeric TM
- Open TM perforation
- Tube myringotomy
- History of stapedectomy
- History of ossicular chain surgery
- History of inner ear surgery
- Facial nerve paralysis secondary to barotrauma
- Inner ear disease other than presbycusis
- Uncorrected upper airway obstruction
- Laryngectomy or status post partial laryngectomy
- Tracheostomy
- Uncorrected laryngocele
- History of vestibular decompression sickness

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12. Divers Alert Network Europe, P.O. Box 64026 Roseto, Italy, telephone non-emergency line: weekdays office hours +39-085-893-0333, emergency line 24 hours: +39-039-605-7858
13. Divers Alert Network S.E.A.P., P. O. Box 384, Ashburton, Australia, telephone 61-3-9886-9166
14. Divers Emergency Service, Australia, [www.rah.sa.gov.au/hyperbaric](http://www.rah.sa.gov.au/hyperbaric), telephone 61-8-8212-9242
15. South Pacific Underwater Medicine Society (SPUMS), P.O. Box 190, Red Hill South, Victoria, Australia, [www.spums.org.au](http://www.spums.org.au)
16. European Underwater and Baromedical Society, [www.eubs.org](http://www.eubs.org)

## ENDORSERS

Paul A. Thombs, M.D., Medical Director  
Hyperbaric Medical Center  
St. Luke's Hospital, Denver, CO, USA

Peter Bennett, Ph.D., D.Sc.  
Professor, Anesthesiology  
Duke University Medical Center  
Durham, NC, USA  
[pbennett@dan.duke.edu](mailto:pbennett@dan.duke.edu)

Richard E. Moon, M.D., F.A.C.P., F.C.C.P.  
Departments of Anesthesiology and Pulmonary  
Medicine  
Duke University Medical Center  
Durham, NC, USA

Roy A. Myers, M.D.  
MIEMS  
Baltimore, MD, USA

William Clem, M.D., Hyperbaric Consultant  
Division Presbyterian/St. Luke's Medical Center  
Denver, CO, USA

John M. Alexander, M.D.  
Northridge Hospital  
Los Angeles, CA, USA

Des Gorman, B.Sc., M.B.Ch.B., F.A.C.O.M.,  
F.A.F.O.M., Ph.D.  
Professor of Medicine  
University of Auckland, Auckland, NZ  
[d.gorman@auckland.ac.nz](mailto:d.gorman@auckland.ac.nz)

Alf O. Brubakk, M.D., Ph.D.  
Norwegian University of Science and Technology  
Trondheim, Norway  
[alfb@medisin.ntnu.no](mailto:alfb@medisin.ntnu.no)

Alessandro Marroni, M.D.  
Director, DAN Europe  
Roseto, Italy  
Hugh Greer, M.D.  
Santa Barbara, CA, USA  
[hdgblgfp@aol.com](mailto:hdgblgfp@aol.com)

Christopher J. Acott, M.B.B.S., Dip. D.H.M.,  
F.A.N.Z.C.A.  
Physician in Charge, Diving Medicine  
Royal Adelaide Hospital  
Adelaide, SA 5000, Australia

Chris Edge, M.A., Ph.D., M.B.B.S., A.F.O.M.  
Nuffield Department of Anaesthetics  
Radcliffe Infirmary  
Oxford, United Kingdom  
[cjedge@diver.demon.co.uk](mailto:cjedge@diver.demon.co.uk)

Richard Vann, Ph.D.  
Duke University Medical Center  
Durham, NC, USA

Keith Van Meter, M.D., F.A.C.E.P.  
Assistant Clinical Professor of Surgery  
Tulane University School of Medicine  
New Orleans, LA, USA

Robert W. Goldmann, M.D.  
St. Luke's Hospital  
Milwaukee, WI, USA

Paul G. Linaweaver, M.D., F.A.C.P.  
Santa Barbara Medical Clinic  
Undersea Medical Specialist  
Santa Barbara, CA, USA

James Vorosmarti, M.D.  
6 Orchard Way South  
Rockville, MD, USA

Tom S. Neuman, M.D., F.A.C.P., F.A.C.P.M.  
Associate Director, Emergency Medical Services  
Professor of Medicine and Surgery  
University of California at San Diego  
San Diego, CA, USA

Yoshihiro Mano, M.D.  
Professor  
Tokyo Medical and Dental University  
Tokyo, Japan  
[y.mano.ns@tmd.ac.jp](mailto:y.mano.ns@tmd.ac.jp)

Simon Mitchell, MB.ChB., DipDHM, Ph.D.  
Wesley Centre for Hyperbaric Medicine  
Medical Director  
Sandford Jackson Bldg., 30 Chasely Street  
Auchenflower, QLD 4066 Australia  
[smitchell@wesley.com.au](mailto:smitchell@wesley.com.au)

Jan Risberg, M.D., Ph.D.  
NUI, Norway

Karen B. Van Hoesen, M.D.  
Associate Clinical Professor  
UCSD Diving Medicine Center  
University of California at San Diego  
San Diego, CA, USA

Edmond Kay, M.D., F.A.A.F.P.  
Dive Physician & Asst. Clinical Prof. of Family Medicine  
University of Washington  
Seattle, WA, USA  
[ekay@u.washington.edu](mailto:ekay@u.washington.edu)

Christopher W. Dueker, TWS, M.D.  
Atherton, CA, USA  
[chrisduek@aol.com](mailto:chrisduek@aol.com)

Charles E. Lehner, Ph.D.  
Department of Surgical Sciences  
University of Wisconsin  
Madison, WI, USA  
[celehner@facstaff.wisc.edu](mailto:celehner@facstaff.wisc.edu)

Undersea & Hyperbaric Medical Society  
10531 Metropolitan Avenue  
Kensington, MD 20895, USA

Diver's Alert Network (DAN)  
6 West Colony Place  
Durham, NC 27705