

# **Welcome –**

**Exploring the underwater world is both fun and serious.**

**Scuba diving is enjoyed by millions of people all over the world.**

**Scuba Diving requires:**

- **Some physical fitness**
- **Ability to solve problems that come up**
- **Emotional maturity**

**You should have good general health and be comfortable in and around the water to scuba dive.**



**Like any adventurous activity, there are potential risks in scuba diving. However, these are well known and easy to avoid by following some simple rules.**

**Possible risks specific to scuba diving include:**

- **Problems with your ears**
- **Drowning and breathing-in water**
- **Getting cold in the water**
- **Lung over-expansion injury**

**It is important to follow some simple rules to avoid injury, which, although unlikely, could be serious, even fatal.**

**You will learn these rules during your scuba diving program.**

**When you follow these rules and suggestions, scuba diving is a reasonably safe and fun activity.**

# Roles and Responsibilities

**PADI's Role:** to provide the best training materials and educational support possible.

**PADI Instructor's Role:** to supervise your training, follow PADI's guidelines and provide as safe a diving experience as possible.

**Parent's Responsibility:** to help evaluate your medical, physical and emotional readiness to participate in scuba diving.

- If you or your parents know of any medical problems you may have, you'll need to see a medical doctor before scuba diving.
- The PADI Medical Statement will help you, your parents and the doctor review your medical fitness to participate.

**Your Responsibility:** to understand and put to use the following six **ACTION** steps during your scuba diving adventure.



# ATTENTION

- Pay attention, listen and follow the rules.
- Diving is exciting and you can become distracted, but stay focused on your instructor and the assistants.
- Be sure to follow the rules covered by your instructor to help lower your risks and increase your fun.
- Failure to follow these rules can lead to serious injury, even fatality.



# COMMUNICATION

- If you don't understand something, or get confused, ask your instructor.
- Your instructor is there to help and to answer your questions.
- Don't be shy, it's important for you to understand.
- You may find that other people have the same questions you have!



## **TAKE CARE OF YOUR EQUIPMENT**

- **We were not born to live underwater. That's why we have to use scuba equipment.**
- **Without properly cared for equipment, you increase your risks and make it harder to dive safely and comfortably.**
- **It's very important that all your equipment is designed for scuba diving and fits you properly.**
- **Be sure to take care of your equipment every time you use it.**



# INFORM

- Inform your instructor of how you feel.
- Tell your instructor if you're cold, tired, having a problem or don't understand something.
- You'll learn hand signals so you can "talk" with your instructor underwater.



# OBSERVE

- **Observe how your instructor does things and follow the example.**
- **Watch where your instructor is and be sure to watch for signals and direction.**





## NOW HAVE FUN!

- Don't forget to have fun!
- Scuba diving is a serious activity and there are risks involved. But you can manage these risks and avoid injury by following the simple **ACTION** steps.
- Paying careful attention to proper training and instruction will teach you how to avoid injury and reduce the risk of hurting yourself.
- So take **ACTION** and have a great time. The fun has just begun!

Please **fill out** and **bring with you** for sign in on Monday the following documents (3 pages):

- PADI Seal Team Statement
- PADI Seal Team Assumption of Risk and Liability Release Agreement
- Youth Diving: Responsibility and Risks Acknowledgment



# PADI Seal Team Statement

## Participant Record (confidential information)

PLEASE PRINT CLEARLY.

Name \_\_\_\_\_ Birthdate \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

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

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

Home Phone (\_\_\_\_) \_\_\_\_\_ email \_\_\_\_\_

**Emergency contact** \_\_\_\_\_ Relationship \_\_\_\_\_

Primary Phone (\_\_\_\_) \_\_\_\_\_  Home  Work  Cell

Secondary Phone (\_\_\_\_) \_\_\_\_\_  Home  Work  Cell

How did you hear about us? \_\_\_\_\_

### MEDICAL QUESTIONNAIRE

**To the participant and parent:** Please answer YES or NO to any of the following items to accurately reflect the participant's past medical history or present medical condition. A YES answer to any of these items requires that a participant obtain written medical approval **before** being allowed to participate in scuba diving activities. If this applies, please ask for a Medical Statement (#10063) to take to the physician.

Yes  No I am currently suffering from a cold or congestion.

Yes  No I have a history of respiratory problems or disease.

Yes  No I have had asthma, emphysema or tuberculosis.

Yes  No I currently have an ear infection.

Yes  No I have recurrent ear problems, ear disease or surgery.

Yes  No I have a history of sinus problems.

Yes  No I have had problems equalizing (popping) my ears with airplane or mountain travel.

Yes  No I am diabetic.

Yes  No I have a history of heart condition (e.g., cardiovascular disease, angina, heart attack).

Yes  No I have a history of seizures, dizziness or fainting.

Yes  No I have a nervous system disorder.

Yes  No I have behavioral health, mental or psychological disorders (panic attack, fear of closed or open spaces).

Yes  No I have recurrent back problems, history of back or spinal surgery.

Yes  No I am currently taking prescription medication that carries a warning about impairment of physical and mental abilities (with the exception of anti-malarial).

Yes  No I have recently had an operation or illness.

Yes  No I am under the care of a physician or have a chronic illness.

— over —

# **PADI SEAL TEAM ASSUMPTION OF RISK AND LIABILITY RELEASE AGREEMENT**

**Please read carefully and fill in all blanks before signing.**

I, \_\_\_\_\_, parent/guardian and \_\_\_\_\_, participant, hereby affirm that we are aware of and understand there are inherent hazards associated with skin diving and scuba diving which may result in serious injury or death.

We understand there are certain risks associated with aquatic activities conducted in and around a swimming pool or confined water dive site, and we expressly assume the risk of said injuries.

We understand the PADI Seal Team program is a series of AquaMissions which will be conducted in a swimming pool or confined water dive site. We understand that my child may choose to participate in one or all of these AquaMissions. These AquaMissions include, but are not limited to, five (5) core AquaMissions involving the introduction of basic dive skills and ten (10) specialty AquaMissions including, but not limited to, Creature ID Specialist, Environmental Specialist, Inner Space Specialist, Navigation Specialist, Night Specialist, Search and Recovery Specialist, Skin Diver Specialist, Snapshot Specialist, Team Safety Specialist and Wreck Specialist We understand and agree that this Release encompasses and applies to all the PADI Seal Team AquaMissions, as described above, in which my child chooses to participate.

Further, we hereby state and agree that this Release will be effective and valid for all PADI Seal Team activities in which my child participates for a period of one year from the initial date on which I execute this Release.

We understand that diving with compressed air involves certain inherent risks and my child will be exposed to these risks. Decompression sickness, embolism or other hyperbaric injuries can occur which require treatment in a recompression chamber. We further understand that this activity may be conducted at a site that is remote, either by time or distance or both, from such a recompression chamber. We still choose to proceed with this activity in spite of the absence of a recompression chamber in proximity to the activity site.

We understand and agree that neither the dive professionals conducting this activity, nor the facility through which this activity is conducted, \_\_\_\_\_, nor International PADI, Inc., nor any of their respective employees, officers, agents 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 my child, me, my family, our heirs or assigns that may occur as a result of my child's participation in this activity or as a result of the negligence of any party, including the Released Parties, whether passive or active.

We further understand that scuba diving is a physically strenuous activity and that my child will be exerting him/herself during this activity and that if my child is injured as a result of heart attack, panic, hyperventilation, etc., that we expressly assume the risk of said injuries to my child. We affirm that we will not hold the above listed individuals or companies responsible for the same.

In consideration of my child being allowed to participate in this activity we hereby personally assume all risks in connection with the activity for any harm, injury or damage that may befall my child while participating in the activity, including all risks connected therewith, whether foreseen or unforeseen.

We further release and hold harmless said activity and the Released Parties from any claim or lawsuit by my child, me, or my family, or our estate, heirs or assigns, arising out of my child's participation in this activity.

We understand and agree this Release is divisible, and any portion herein held to be in violation of any applicable statutes or regulations or any governmental agency having jurisdiction shall affect only that portion held to be invalid or inoperative, and the remaining portions of this Release shall remain in full force and effect.

I further state that I am of lawful age and legally competent to sign this Assumption of Risk and Liability Release Agreement, and as the parent am providing written consent for the participation of my child.

We understand that the terms herein are contractual and not a mere recital and that we have signed this Release of our own free act.

I, \_\_\_\_\_, PARENT/GUARDIAN AND \_\_\_\_\_, PARTICIPANT, BY THIS INSTRUMENT DO EXEMPT AND RELEASE THE DIVE PROFESSIONALS CONDUCTING THIS ACTIVITY, THE FACILITY THROUGH WHICH THIS ACTIVITY IS CONDUCTED, 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.

WE HAVE FULLY INFORMED OURSELVES OF THE CONTENTS OF THIS ASSUMPTION OF RISK AND LIABILITY RELEASE AGREEMENT BY READING IT BEFORE SIGNING IT ON BEHALF OF MYSELF, MY CHILD, AND OUR HEIRS.

Signature of Participant	Date (day/month/year)
Signature of Parent/Guardian	Date (day/month/year)



# Youth Diving: Responsibility and Risks Acknowledgment

(Please read carefully, fill in all blanks, and sign and date below.)

I/we, \_\_\_\_\_, and my/our child, \_\_\_\_\_, have viewed and understand the Youth Diving: Responsibility and Risks video or flip chart. We affirm we have been advised and thoroughly informed that diving is an adventure sport with inherent risks to the participant. These risks may include, but are not limited to, pressure related injuries affecting the lungs, sinuses and ears, drowning, panic and other serious injury or death. We also understand our responsibilities, as parent and participant (child), in participating in scuba activities and agree to accept those responsibilities.

As the parent/guardian of the minor child, I/we understand and agree it is solely my/our responsibility to evaluate whether my/our child should participate in scuba activities. Our decision is based upon our knowledge of the mental, physical and emotional abilities of our child, as well as his/her medical history. I/we understand and agree it is my/our responsibility to discuss with a physician any questions I/we have regarding my/our child's medical history and participation in this activity.

I/we understand and agree that it is my/our responsibility to continue to monitor the abilities and health of my/our child to determine whether he/she should continue in this program and continue to dive after the program.

I/we agree to abide by all supervisory and depth limitations that may accompany my/our child's PADI certification.

I/we understand that PADI certifies instructors/dive centers and provides materials for programs developed by PADI.

I/we understand that the dive center/resort and the instructor are responsible for the conduct and supervision of this activity

I/we understand my responsibilities and those of my child as set forth in the Youth Diving Responsibilities and Risk video or flip chart.

I/we have read this Acknowledgment, understand and agree to the terms and conditions, and understand and agree that this Acknowledgment is a binding contract between us, the dive professional, the dive facility and PADI.

\_\_\_\_\_  
Parent/Guardian Name

\_\_\_\_\_  
Parent/Guardian Signature

\_\_\_\_\_  
(Day/Month/Year)

\_\_\_\_\_  
Participant/Minor Name

\_\_\_\_\_  
Participant/Minor Signature

\_\_\_\_\_  
(Day/Month/Year)

If your child answered 'YES' for **any** of the medical questions on the "*Seal Team Statement*" above, you **MUST get consent from a physician before any SCUBA activities can occur.**

Please bring the form below filled out by a physician with you for sign in on Monday

If your child answered 'NO' to **all** medical questions on the "*Seal Team Statement*", you **do not** need to fill out the following document.



# 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 \_\_\_\_\_ and  
Instructor

\_\_\_\_\_ located in the  
Facility

city of \_\_\_\_\_, state/province of \_\_\_\_\_.

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

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?

**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.)?

**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.diversalernetnetwork.org](http://www.diversalernetnetwork.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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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)

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