

Medical Statement Participant Record (Confidential Information)

	P.S.T.C (1) UNDERSEA &
Please Print Name:	PYPERBARIC MEDICAL SOCIETY OF THE PROPERTY OF
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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. In addition, if your medical condition changes at any time during your scuba programs it is important that you inform your instructor immediately.

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.

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.

	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 openspaces)? 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.)? 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?	
Participant's Signature		Date (Day / Month / Year)
Signature of Parent or Guardian (where	applicable)	Date (Day / Month / Year)

STUDENT Please print legibly. Name Birth Date _ Age_ Day/Month/Year Mailing Address City State/Province/Region _____ Country Zip/Postal Code _____ Business Phone () Home 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 _____ Email Phone (Were you ever required to have a physical for diving es " lo If so, when?____ **PHYSICIAN** 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 Date Physician's Signature or Legal Representative of Medical Practitioner Day/Month/Year _ Clinic/Hospital Physician _

Email

Address

Phone (

Guidelines for Recreational Scuba Diver's Physical Examination

Instructions to the Physician

can provide recreational divers with an enjoyable sport safer than many Relative Risk Conditions other activities. The risk of diving is increased by certain physical conditions, which the relationship to diving may not be readily obvious. Thus, Complicated Migraine Headaches whose symptoms or severity 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 decom- • Intracranial Tumor or Aneurysm pression sickness, pulmonary overinflation syndrome with subsequent • Peripheral Neuropathy arterial gas embolization and other conditions such as loss of conscious Multiple Sclerosis ness. which could lead to drowning. Additionally, the diver must be able. Trigeminal Neuralgia 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 Temporary Risk Condition 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 com History of cerebral gas embolism without residual where pulmonary air monly encountered medical problems. The brief introductions should serve as an alert to the nature of the risk posed by each medical probletion and some reason to believe that the probability of recurrence is low. The potential diver and his or her physician must weigh the pleasures to individual's medical condition. As with any recreational activity, there are abnormalities where there is a significant probability of unconsciousa qualitative assessment of relative risk. For the purposes of this document, Severe Risk implies that an indi-

vidual is believed to be at substantially elevated risk of decompression Some conditions are as follows: sickness, pulmonary or otic barotrauma or altered consciousness with subsequent drowning, compared with the general population. The con- • History of seizures other than childhood febrile seizures sultants 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 accept. History of Serious (Central Nervous System, Cerebral or Inner able. 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, CARDIOVASCULAR SYSTEMS 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 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 into the central compartment, an effect that is greatest in cold water. Japan +81 33590 6501 and DAN Southern Africa +27 11 242 0380. In pulmonary edema in patients with impaired left ventricular function Norway: Haukeland sykehus, Seksjon for hyperbarmedisin, tlf: +47 55 or significant valvular disease. The effects of immersion can mostly be websites offering similar advice.

NEUROLOGICAL

Neurological abnormalities affecting a diver's ability to perform exercise needed to assess the risk. should be assessed according to the degree of compromise. Some diving physicians feel that conditions in which there can be a waxing and waning METS is a term used to describe the metabolic cost. The MET at rest is one, 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 Recreational SCUBA (Self-Contained Underwater Breathing Apparatus) injury resulting in unconsciousness should be evaluated for risk of seizure.

- impair motor or cognitive function, neurologic manifestations
- History of Head Injury with seguelae other than seizure
- Herniated Nucleus Pulposus

- History of spinal cord or brain injury

trapping has been excluded and for which there is a satisfactory explana-

no data for diving enabling the calculation of an accurate mathematical ness, hence putting the diver at increased risk of drowning. Divers with probability of injury. Experience and physiological principles only permit spinal cord or brain abnormalities where perfusion is impaired may be at increased risk of decompression sickness.

- History of Transient Ischemic Attack (TIA) or Cerebrovascular Accident (CVA)
- Ear) Decompression Sickness with residual deficits

Relative Risk Conditions

The diagnoses listed below potentially render the diver unable to meet the exertional performance requirements likely to be encountered in recreati onal 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 University Health System are available for consultation by phone +1 91\$uggested minimum criteria for stress testing in such cases is at least 13 684 2948 during normal business hours. For emergency calls, 24 hours 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 and Divers Emergency Service (DES) in Australia +61 8 8212 9242, DAThe marked increase in cardiac preload during immersion can precipitate 97 38 75, fax: +47 55 97 51 37. There are also a number of informative gauged by an assessment of the diver's performance while swimming on thesurface. 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

> 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 dysrythmias 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 predis- Peptic Ulcer Disease associated with pyloric obstruction or pose to spontaneous pneumothorax: Asthma (reactive airway disease), Chronic Obstructive Pulmonary Disease (COPD), cystic or cavitating lungunrepaired hernias of the abdominal wall large enough to diseases may all cause air trapping. The 1996 Undersea and Hyperbaric contain bowel within the hernia sac could incarcerate. 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 Inflammatory Bowel Disease tests (e.g.: using histamine, hypertonic saline or methacholine) are not • Functional Bowel Disorders sufficiently standardized to be interpreted in the context of scuba diving.

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

to either structural disorders of the lung or chest wall or neuromuscular or, in the case of the upper GI tract, emesis. Emesis underwater may 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. Severe Risk Conditions Respiratory limitation due to disease is compounded by the combined effects of immersion (causing a restrictive deficit) and the increase in gasGastric outlet obstruction of a degree sufficient to produce 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 pneumotho-
- * 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

severe reflux

Relative Risk Conditions

Altered anatomical relationships secondary to surgery or malformations that lead to gas trapping may cause serious problems. Gas trapped in a In addition to the risk of pulmonary barotrauma, respiratory disease due hollow viscous expands as the divers surfaces and can lead to rupture lead to drowning.

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

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 he inner ear is fluid filled and therefore noncompressible. The flexible 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.

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.

OTOLARYNGOLOGICAL

Drug or alcohol abuse

Active psychosis

Claustrophobia and agoraphobia

History of untreated panic disorder

Equalisation of pressure must take place during ascent and descent be-Abnormalities resulting in altered rheological properties may theoretically tween 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.

> 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 larvnx and pharvnx must be free of an obstruction to airflow. The laryngeal and epiglotic 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 midface fractures may be prone to barotrauma and rupture of the air filled cavities involved.

- 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 prosthedontic devices
- History of mid-face fracture
- Unhealed oral surgery sites
- History of head and/or neck therapeutic radiation
- History of temperomandibular joint dysfunction
- History of round window rupture

BEHAVIORAL HEALTH

Behavioral: The diver's mental capacity and emotional makeup are important to safe diving. The student diver must have sufficient learning abilities to grasp information presented to him by his instructors, be ableto 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

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

BIBLIOGRAPHY/REFERENCE

- Diving. 4th Ed., W.B. Saunders Company Ltd., London, England.
- 2. Bove, A., & Davis, J. (1990). Diving Medicine. 2nd Edition. W.B. Saunders Company, Philadelphia, PA.
- 3. Davis, J., & Bove, A. (1986). "Medical Examination of Sport Scuba Divers. Medical Seminars. Inc.." San Antonio. TX
- 4. Dembert, M. & Keith, J. (1986). "Evaluating the Potential Pediatric Scuba Diver." AJDC, Vol. 140, November.
- 5. Edmonds, C., Lowry, C., & Pennefether, J. (1992) .3rd ed., Diving and Subaquatic Medicine. Butterworth & Heineman Ltd., Oxford, England,
- 6. Elliott, D. (Ed) (1994). "Medical Assessment of Fitness to Dive." Proceedings of an International Conference at the Edinburgh Conference Centre, Biomedical Seminars, Surry, England.
- "Fitness to Dive," Proceedings of the 34th Underwater & Hyperbaric, 15. South Pacific Underwater Medicine Society (SPUMS), P.O. Box 190, Medical Society Workshop (1987) UHMS Publication Number 70(WS-FD) Bethesda, MD.

- 1. Bennett, P. & Elliott, D (eds.)(1993). The Physiology and Medicine & Neuman, T. & Bove, A. (1994). "Asthma and Diving." Ann. Allergy, Vol. 73, October, O'Conner & Kelsen.
 - 9. Shilling, C. & Carlston, D. & Mathias, R. (eds) (1984). The Physician's Guide to Diving Medicine. Plennum Press, New York, NY.
 - 10. Undersea and Hyperbaric Medical Society (UHMS) www.UHMS.org
 - 11. Divers Alert Network (DAN) United States, 6 West Colony Place, Durham, NC www.DiversAlertNetwork.org
 - 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, telephone 61-8-8212-9242
 - Red Hill South, Victoria, Australia, www.spums.org.au
 - 16. European Underwater and Baromedical Society, www.eubs.org

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