Guidelines for
RECREATIONAL SCUBA DIVER'S
PHYSICAL EXAMINATION

Instructions to the Physician:

Recreational scuba (self contained underwater breathing apparatus) diving has an excellent safety record. To maintain this status it is important to screen student divers for physical deficiencies that could place them in peril in the underwater environment.

The Recreational Scuba Diver's Physical Examination contains elements of medical history, review of systems and physical examination. It is designed to detect conditions that put a diver at increased risk for decompression sickness, pulmonary overinflation syndrome with subsequent cerebral gas embolization and loss of consciousness that could lead to drowning. Additionally, the diver must be able to withstand some degree of cold stress, cope with the optical effects of water and have a reserve of physical and mental abilities 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 contraindications, relative and absolute, is not all inclusive. It contains the most commonly encountered medical problems only. The brief introductions should serve to alert the physician to the nature of medical problems that put the diver at risk, and (lead him) to consider the individual patient's state of health.

Diagnostic studies and specialty consultations should be obtained as indicated to satisfy the physician as to the diver's status. A list of references is included to aid in clarifying issues that arise. Physicians at the Divers Alert Network (DAN) are available for consultation by phone (919) 684-2948 during normal business hours. For emergency calls, 24 hours, 7 days a week, call (919) 684-8111.

Some conditions are absolute contraindications to scuba diving. Conditions that are absolute contraindications place the diver at increased risk for injury or death. Others are relative contraindications to scuba that may be resolved with time and proper medical intervention. Ultimately the physician should decide with the individual, based on his knowledge of the patient's medical status, whether the individual is physically qualified to participate in scuba diving.

Remember at all times that scuba is a recreational sport, and it should be fun, not a source of morbidity or mortality.

CARDIOVASCULAR SYSTEMS

Relative Contraindications: The diagnoses listed below potentially render the diver unable to meet the exertional performance requirements likely to be encountered in recreational diving. The diagnoses listed 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 13 METS. Failure to meet the exercise criteria is disqualifying. Conditioning and retesting may make later qualification possible.

- History of CABG or PCTA for CAD
- History of myocardial infarction
- Hypertension
- History of dysrhythmias requiring medication for suppression
- Valvular regurgitation
- Asymptomatic mitral valve prolapse
- Pacemakers -- The pathologic process that necessitated pacing should be addressed regarding the fitness to dive. Finally in the 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 (to depths of 130 feet of sea water).

Absolute Contraindications: Venous gas emboli produced during decompression may cross intracardiac shunts and enter the cerebral circulation with potentially catastrophic results. Asymmetric septal hypertrophy and valvular stenosis may lead to the sudden onset of unconsciousness during exercise.

- Congestive heart failure
PULMONARY

Any process or lesion that impedes air flow from the lung places the diver at risk for pulmonary overinflation with alveolar rupture and the possibility of cerebral air embolization. Asthma (reactive airway disease), COPD cystic or cavitating lung diseases all may lead to air trapping. Spirometry, provocative tests such as methacholine challenge and other studies to detect air trapping should be carried out to establish to the examining physician's satisfaction that the diver is not at risk. A pneumothorax that occurs or recurs while diving is catastrophic. As the diver ascends, air trapped in the cavity expands rapidly producing a tension pneumothorax.

Relative Contraindications:
- History of prior asthma or reactive airway disease (RAD)*
- History of exercise/cold induced bronchospasm (EIB)*
- History of solid, cystic or cavitating lesion*
- Pneumothorax secondary to: thoracic surgery,* trauma or pleural penetration,* previous overinflation injury*
- Restrictive Disease**

(*Air Trapping must be excluded)
(**Exercise Testing necessary)

Absolute Contraindications:
- Active RAD (asthma), EIB, COPD or history of the same with abnormal PFT's or positive challenge
- Restrictive diseases with exercise impairment
- History of spontaneous pneumothorax.

NEUROLOGICAL

Neurologic abnormalities that affect a diver's ability to perform exercise should be assessed individually based on the degree of compromise involved.

Relative Contraindications:
- Migraine headaches whose symptoms or severity impair motor or cognitive function
- History of head injury with sequelae other than seizure
- Herniated nucleus pulposus
- Peripheral neuropathy
- Trigeminal neuralgia
- History of spinal cord or brain injury without residual neurologic deficit
- History of cerebral gas embolism without residual neurologic deficit where pulmonary air trapping has been excluded
- Cerebral palsy in the absence of seizure activity

Absolute Contraindications: Abnormalities where the level of consciousness is subject to impairment put the diver at increased risk of drowning. Divers with spinal cord or brain abnormalities where perfusion is impaired are at increased risk of spinal cord or cerebral decompression sickness.

- History of seizures other than childhood febrile seizures
- Intracranial tumor or aneurysm
- History of TIA or CVA
- History of spinal cord injury, disease or surgery with residual sequelae
- History of Type II (serious and/or central nervous system) decompression sickness with permanent neurologic deficits

OTOLARYNGOLOGICAL

Equalization 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 subject to pressure changes, however. Previously ruptured but healed round or oval window
membranes are at increased risk of rupture due to failure to equalize pressure or due to marked overpressurization during vigorous or explosive Valsalva maneuvers.

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 mouth piece. Individuals who have had mid-face fractures may be prone to barotrauma and rupture of the air filled cavities involved.

**Relative Contraindications:**

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

**Absolute Contraindications:**

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

**GASTROINTESTINAL**

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

- Peptic ulcer disease
- Inflammatory bowel disease
- Malabsorption states
- Functional bowel disorders
- Post gastrectomy dumping syndrome
- Paraesophageal or hiatal hernia

**Absolute contraindications:** 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 diver surfaces and can lead to rupture or in the case of the upper GI tract, emesis. Emesis underwater may lead to drowning.

- High grade gastric outlet obstruction
- Chronic or recurrent small bowel obstruction
- Enteroctaneous fistulae that do not drain freely
- Esophageal diverticula
- Severe gastroesophageal reflux
- Achalasia
- Unrepaired hernias of the abdominal wall potentially containing bowel
**METABOLIC AND ENDOCRINOLOGICAL**

*Relative Contraindications:* 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. Generally divers with altered hormonal status should be in as near an optimal physiologic state as is possible. It should be noted that obesity predisposes the individual to decompression sickness and is an indicator of poor overall physical fitness.

- Hormonal excess or deficiency
- Obesity
- Renal insufficiency

*Absolute Contraindications:* The potentially rapid change in level of consciousness associated with hypoglycemia in diabetics on insulin therapy or oral anti-hypoglycemia medications can result in drowning. Diving is therefore contraindicated.

**PREGNANCY**

Venous gas emboli formed during decompression may result in fetal malformations. Diving is absolutely contraindicated during any stage of pregnancy.

**HEMATOLOGICAL**

Abnormalities resulting in altered theological properties may increase the risk of decompression sickness.

*Relative Contraindications:*
- Sickle cell trait
- Acute anemia

*Absolute Contraindications:*
- Sickle cell disease
- Polycythemia
- Leukemia

**ORTHOPEDIC**

Relative impairment of mobility particularly in the small boat environment or ashore with equipment weighing up to 40 pounds must be assessed. The impact of exercise ability is also an important consideration.

*Relative Contraindications:*
- Chronic back pain
- Amputation
- Scoliosis -- must also assess impact on pulmonary function
- Aseptic necrosis -- possible risk of progression related to adequacy of decompression

**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 able to safely plan and execute his own dives and react to changes about him in the underwater environment. The student's motivation to learn scuba and his ability to deal with potentially dangerous situations is also crucial to safe diving.

*Relative Contraindications:*
- Developmental delay
- History of drug or alcohol abuse
- History of previous psychotic episodes

*Absolute Contraindications:*
- Inappropriate motivation to dive -- solely to please spouse or partner, to prove oneself in the face of personal fears
- Claustrophobia and agoraphobia
- Active psychosis or while receiving psychotropic medications
- History of panic disorder
- Drug or alcohol abuse
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4. Medical Examination of Sport Scuba Divers, 2nd Ed., Davis Medical Seminars Inc., 1986
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This form has been
developed in conjunction with the Recreational Scuba Training Council
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:

(INSTRUCTOR) ________________________________________

and (FACILITY) ________________________________________

located in the city of ______________________________________

and state of ______________________________________.

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

Medical History

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.

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 a medical statement and guidelines for recreational scuba diver's physical examination to take to your physician.

________ Are you over 45 years of age and have one or more of the following?
- currently smoke a pipe, cigars, or cigarettes
- have a high cholesterol level
- have a family history of heart attacks or strokes

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)?
________ History of chest surgery?
________ Claustrophobia or agoraphobia (fear of closed or open spaces)?
________ Behavioral health problems?
________ Epilepsy, seizures, convulsions or take medications to prevent them?
________ Recurring migraine headaches or take medications to prevent them?
________ History of blackouts or fainting (full/partial loss of consciousness)?
________ Do you frequently suffer from motion sickness (seasick, carsick, etc.)?
________ History of diving accidents or decompression sickness?
________ History of recurrent back problems?
________ History of back surgery?
________ History of diabetes?
________ History of back, arm or leg problems following surgery, injury or fracture?
________ Inability to perform moderate exercise (walk one mile within 12 minutes)?
________ History of high blood pressure or take medications to control blood pressure?
________ History of any heart disease?
________ History of heart attacks?
________ Angina or heart blood vessel surgery?
________ History of ear or sinus surgery?
________ History of ear disease, hearing loss or problems with balance?
________ History of problems equalizing (popping) ears with airplane or mountain travel?
________ History of bleeding or other blood disorders?
________ History of any type of hernia?
________ History of ulcers or ulcer surgery?
________ History of colostomy?
________ History of drug or alcohol abuse?

The information I have provided about my medical history is accurate to the best of my knowledge.

SIGNATURE ____________________________

SIGNATURES OF PARENTS OR GUARDIANS WHERE APPLICABLE

________________________________________

________________________________________
Name ____________________________________________________ Birth Date ___________________ Age __________

Mailing Address ______________________________________________________________________________________
____________________________________________________________________________________________________
City ___________________________________________ State/Province ________________________________________
Country _______________________________________________________ Zip/Postal Code ________________________
Home Phone _____________________________________ Business Phone ______________________________________
Fax ____________________________________________ E-mail ______________________________________________

Name and address of your family or primary care physician:
Physician __________________________________________ Clinic/Hospital ______________________________________
Address ___________________________________________ Phone ___________________________________________

Date of last physical examination _________________________________________________________________________
Name of examiner ___________________________________ Clinic/Hospital _____________________________________
Address ___________________________________________ Phone ___________________________________________

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

Physician

This person is an applicant 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, Please review Guidelines for Recreational Scuba Diver's Physical Examination,

Physician's Impression:
☐ I find no medical conditions that I consider incompatible with diving.
☐ I am unable to recommend this individual for diving.

Remarks _____________________________________________________________________________________________

I have reviewed Guidelines for Recreational Scuba Diver's Physical Examination.
________________________________________________________________________, M.D. Date ___________________

Physician __________________________________________ Clinic/Hospital ______________________________________
Address ___________________________________________ Phone ___________________________________________

APPLICANT
(Please print legibly)