



DIVING MEDICAL EXAM OVERVIEW FOR THE EXAMINING PHYSICIAN

TO THE EXAMINING PHYSICIAN:

This person, _____, requires a medical examination to assess their fitness for certification as a Scientific Diver for the California Polytechnic State University San Luis Obispo (Cal Poly). Their answers on the Diving Medical History Form (attached) may indicate potential health or safety risks as noted. Your evaluation is requested on the attached scuba Diving Fitness Medical Evaluation Report. If you have questions about diving medicine, you may wish to consult one of the references on the attached list or contact one of the physicians with expertise in diving medicine whose names and phone numbers appear on an attached list, the Undersea Hyperbaric and Medical Society, or the Divers Alert Network. Please contact the undersigned Diving Safety Officer if you have any questions or concerns about diving medicine or the Cal Poly standards. Thank you for your assistance.

Jason Felton, Diving Safety Officer - (805) 756-6058

Date

Scuba and other modes of compressed-gas diving can be strenuous and hazardous. A special risk is present if the middle ear, sinuses, or lung segments do not readily equalize air pressure changes. The most common cause of distress is eustachian insufficiency. Recent deaths in the scientific diving community have been attributed to cardiovascular disease. Please consult the following list of conditions that usually restrict candidates from diving.

(Adapted from Bove, 1998: bracketed numbers are pages in Bove)

CONDITIONS WHICH MAY DISQUALIFY CANDIDATES FROM DIVING

1. Abnormalities of the tympanic membrane, such as perforation, presence of a monomeric membrane, or inability to autoinflate the middle ears. [5, 7, 8, 9]
2. Vertigo, including Meniere's Disease. [13]
3. Stapedectomy or middle ear reconstructive surgery. [11]
4. Recent ocular surgery. [15, 18, 19]
5. Psychiatric disorders including claustrophobia, suicidal ideation, psychosis, anxiety states, untreated depression. [20 - 23]
6. Substance abuse, including alcohol. [24 - 25]
7. Episodic loss of consciousness. [1, 26, 27]
8. History of seizure. [27, 28]
9. History of stroke or a fixed neurological deficit. [29, 30]
10. Recurring neurologic disorders, including transient ischemic attacks. [29, 30]
11. History of intracranial aneurysm, other vascular malformation or intracranial hemorrhage. [31]
12. History of neurological decompression illness with residual deficit. [29, 30]
13. Head injury with sequelae. [26, 27]
14. Hematologic disorders including coagulopathies. [41, 42]
15. Evidence of coronary artery disease or high risk for coronary artery disease. [33 - 35]
16. Atrial septal defects. [39]
17. Significant valvular heart disease - isolated mitral valve prolapse is not disqualifying. [38]
18. Significant cardiac rhythm or conduction abnormalities. [36 - 37]
19. Implanted cardiac pacemakers and cardiac defibrillators (ICD). [39, 40]
20. Inadequate exercise tolerance. [34]
21. Severe hypertension. [35]
22. History of spontaneous or traumatic pneumothorax. [45]
23. Asthma. [42 - 44]
24. Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae, or cysts. [45,46]
25. Diabetes mellitus. [46 - 47]
26. Pregnancy. [56]

SELECTED REFERENCES IN DIVING MEDICINE

Available from Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100, the Divers Alert Network (DAN) or the Undersea and Hyperbaric Medical Society (UHMS), Durham, NC

- Elliott, D.H. ed. 1996. *Are Asthmatics Fit to Dive?* Kensington, MD: Undersea and Hyperbaric Medical Society.
- Bove, A.A. 2011. The cardiovascular system and diving risk. *Undersea and Hyperbaric Medicine* 38(4): 261-269.
- Thompson, P.D. 2011. The cardiovascular risks of diving. *Undersea and Hyperbaric Medicine* 38(4): 271-277.
- Douglas, P.S. 2011. Cardiovascular screening in asymptomatic adults: Lessons for the diving world. *Undersea and Hyperbaric Medicine* 38(4): 279-287.
- Mitchell, S.J., and A.A. Bove. 2011. Medical screening of recreational divers for cardiovascular disease: Consensus discussion at the Divers Alert Network Fatality Workshop. *Undersea and Hyperbaric Medicine* 38(4): 289-296.
- Grundy, S.M., Pasternak, R., Greenland, P., Smith, S., and Fuster, V. 1999. Assessment of Cardiovascular Risk by Use of Multiple-Risk-Factor Assessment Equations. AHA/ACC Scientific Statement. *Journal of the American College of Cardiology*, 34: 1348-1359. <http://content.onlinejacc.org/cgi/content/short/34/4/1348>
- Bove, A.A. and Davis, J. 2003. *DIVING MEDICINE*, Fourth Edition. Philadelphia: W.B. Saunders Company.
- Edmonds, C., Lowry, C., Pennefather, J. and Walker, R. 2002. *DIVING AND SUBAQUATIC MEDICINE*, Fourth Edition. London: Hodder Arnold Publishers.
- Bove, A.A. ed. 1998. *MEDICAL EXAMINATION OF SPORT SCUBA DIVERS*, San Antonio, TX: Medical Seminars, Inc.
- NOAA *DIVING MANUAL*, NOAA. Superintendent of Documents. Washington, DC: U.S. Government Printing Office.
- U.S. *NAVY DIVING MANUAL*. Superintendent of Documents, Washington, DC: U.S. Government Printing Office, Washington, D.C.

CAL POLY/AAUS MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

Name of Applicant (Print or Type)

Date of Medical Evaluation (Month/Day/Year)

To The Examining Physician: Scientific divers require periodic scuba diving medical examinations to assess their fitness to engage in diving with self-contained underwater breathing apparatus (scuba). Their answers on the Diving Medical History Form may indicate potential health or safety risks as noted. Scuba diving is an activity that puts unusual stress on the individual in several ways. Your evaluation is requested on this Medical Evaluation form. Your opinion on the applicant's medical fitness is requested. Scuba diving requires heavy exertion. The diver must be free of cardiovascular and respiratory disease (see references, following page). An absolute requirement is the ability of the lungs, middle ears and sinuses to equalize pressure. Any condition that risks the loss of consciousness should disqualify the applicant. Please proceed in accordance with the Cal Poly/AAUS Medical Standards (Sec. 5.00). If you have questions about diving medicine, please consult with the Undersea Hyperbaric Medical Society or Divers Alert Network.

TESTS: THE FOLLOWING TESTS ARE REQUIRED:

DURING ALL INITIAL AND PERIODIC RE-EXAMS (UNDER AGE 40):

- Medical history
- Complete physical exam, with emphasis on neurological and otological components
- Urinalysis
- Any further tests deemed necessary by the physician

ADDITIONAL TESTS DURING FIRST EXAM OVER AGE 40 AND PERIODIC RE-EXAMS (OVER AGE 40):

- Chest x-ray (Required only during first exam over age 40)
- Resting EKG
- Assessment of coronary artery disease using Multiple-Risk-Factor Assessment¹ (age, lipid profile, blood pressure, diabetic screening, smoking)

Note: Exercise stress testing may be indicated based on Multiple-Risk-Factor Assessment¹

PHYSICIAN'S STATEMENT:

I have evaluated the above mentioned individual according to the tests listed above. I have discussed with the patient any medical condition(s) that would not disqualify him/her from diving but which may seriously compromise subsequent health. The patient understands the nature of the hazards and the risks involved in diving with these conditions.

_____ 01 I find no medical conditions that may be disqualifying for participation in scuba diving.

Diver **IS** medically qualified to dive for:

_____ 2 years (over age 60)

_____ 3 years (age 40-59)

_____ 5 years (under age 40)

_____ 02 Diver **IS NOT** medically qualified to dive: _____ Permanently _____ Temporarily.

Signature (must be reviewed & signed by an MD or DO) _____ MD or DO _____ Date

Name (Print or Type)

Address

Telephone Number

E-Mail Address

My familiarity with applicant is: _____ This exam only _____ Regular physician for _____ years

My familiarity with diving medicine is: _____

CAL POLY/AAUS MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

APPLICANT'S RELEASE OF MEDICAL INFORMATION FORM

Name of Applicant (Print or Type)

I authorize the release of this information and all medical information subsequently acquired in association with my diving to the California Polytechnic State University San Luis Obispo Diving Safety Officer and Diving Control Board or their designee on (date) _____

Signature of Applicant _____ Date _____

REFERENCES

¹ Grundy, S.M., Pasternak, R., Greenland, P., Smith, S., and Fuster, V. 1999. Assessment of Cardiovascular Risk by Use of Multiple-Risk-Factor Assessment Equations. AHA/ACC Scientific Statement. *Journal of the American College of Cardiology*, 34: 1348-1359. <http://content.onlinejacc.org/cgi/content/short/34/4/1348>

DIVING MEDICAL HISTORY FORM

(To Be Completed By Applicant-Diver)

Name _____ DOB ____/____/____ Age ____ Wt. ____ Ht. ____
(Mo/Day/Yr)

Sponsor _____ Date ____/____/____
(Dept./Project/Program/School, etc.) (Mo/Day/Yr)

TO THE APPLICANT:

Scuba diving places considerable physical and mental demands on the diver. Certain medical and physical requirements must be met before beginning a diving or training program. Your accurate answers to the questions are more important, in many instances, in determining your fitness to dive than what the physician may see, hear or feel as part of the diving medical certification procedure.

This form must be kept confidential by the examining physician. If you believe any question amounts to invasion of your privacy, you may elect to omit an answer, provided that you must subsequently discuss that matter with your own physician who must then indicate, in writing, that you have done so and that no health hazard exists.

Should your answers indicate a condition, which might make diving hazardous, you will be asked to review the matter with your physician. In such instances, their written authorization will be required in order for further consideration to be given to your application. If your physician concludes that diving would involve undue risk for you, remember that they are concerned only with your well-being and safety.

| | Yes | No | Please indicate whether or not the following apply to you | Comments |
|----|-----|----|---|----------|
| 1 | | | Convulsions, seizures, or epilepsy | |
| 2 | | | Fainting spells or dizziness | |
| 3 | | | Been addicted to drugs | |
| 4 | | | Diabetes | |
| 5 | | | Motion sickness or sea/air sickness | |
| 6 | | | Claustrophobia | |
| 7 | | | Mental disorder or nervous breakdown | |
| 8 | | | Are you pregnant? | |
| 9 | | | Do you suffer from menstrual problems? | |
| 10 | | | Anxiety spells or hyperventilation | |
| 11 | | | Frequent sour stomachs, nervous stomachs or vomiting spells | |
| 12 | | | Had a major operation | |
| 13 | | | Presently being treated by a physician | |
| 14 | | | Taking any medication regularly (even non-prescription) | |
| 15 | | | Been rejected or restricted from sports | |
| 16 | | | Headaches (frequent and severe) | |
| 17 | | | Wear dental plates | |
| 18 | | | Wear glasses or contact lenses | |
| 19 | | | Bleeding disorders | |
| 20 | | | Alcoholism | |
| 21 | | | Any problems related to diving | |
| 22 | | | Nervous tension or emotional problems | |

| | Yes | No | Please indicate whether or not the following apply to you | Comments |
|----|-----|----|---|----------|
| 23 | | | Take tranquilizers | |
| 24 | | | Perforated ear drums | |
| 25 | | | Hay fever | |
| 26 | | | Frequent sinus trouble, frequent drainage from the nose, post-nasal drip, or stuffy nose | |
| 27 | | | Frequent earaches | |
| 28 | | | Drainage from the ears | |
| 29 | | | Difficulty with your ears in airplanes or on mountains | |
| 30 | | | Ear surgery | |
| 31 | | | Ringing in your ears | |
| 32 | | | Frequent dizzy spells | |
| 33 | | | Hearing problems | |
| 34 | | | Trouble equalizing pressure in your ears | |
| 35 | | | Asthma | |
| 36 | | | Wheezing attacks | |
| 37 | | | Cough (chronic or recurrent) | |
| 38 | | | Frequently raise sputum | |
| 39 | | | Pleurisy | |
| 40 | | | Collapsed lung (pneumothorax) | |
| 41 | | | Lung cysts | |
| 42 | | | Pneumonia | |
| 43 | | | Tuberculosis | |
| 44 | | | Shortness of breath | |
| 45 | | | Lung problem or abnormality | |
| 46 | | | Spit blood | |
| 47 | | | Breathing difficulty after eating particular foods, after exposure to particular pollens or animals | |
| 48 | | | Are you subject to bronchitis | |
| 49 | | | Subcutaneous emphysema (air under the skin) | |
| 50 | | | Air embolism after diving | |
| 51 | | | Decompression sickness | |
| 52 | | | Rheumatic fever | |
| 53 | | | Scarlet fever | |
| 54 | | | Heart murmur | |
| 55 | | | Large heart | |
| 56 | | | High blood pressure | |
| 57 | | | Angina (heart pains or pressure in the chest) | |
| 58 | | | Heart attack | |

| | Yes | No | Please indicate whether or not the following apply to you | Comments |
|----|-----|----|--|----------|
| 59 | | | Low blood pressure | |
| 60 | | | Recurrent or persistent swelling of the legs | |
| 61 | | | Pounding, rapid heartbeat or palpitations | |
| 62 | | | Easily fatigued or short of breath | |
| 63 | | | Abnormal EKG | |
| 64 | | | Joint problems, dislocations or arthritis | |
| 65 | | | Back trouble or back injuries | |
| 66 | | | Ruptured or slipped disk | |
| 67 | | | Limiting physical handicaps | |
| 68 | | | Muscle cramps | |
| 69 | | | Varicose veins | |
| 70 | | | Amputations | |
| 71 | | | Head injury causing unconsciousness | |
| 72 | | | Paralysis | |
| 73 | | | Have you ever had an adverse reaction to medication? | |
| 74 | | | Do you smoke? | |
| 75 | | | Have you ever had any other medical problems not listed? If so, please list or describe below; | |
| 76 | | | Is there a family history of high cholesterol? | |
| 77 | | | Is there a family history of heart disease or stroke? | |
| 78 | | | Is there a family history of diabetes? | |
| 79 | | | Is there a family history of asthma? | |
| 80 | | | Date of last tetanus shot? Vaccination dates? Covid-19 Vaccination? | |

Please explain any “yes” answers to the above questions.

I certify that the above answers and information represent an accurate and complete description of my medical history.

Signature

Date

RECOMMENDED PHYSICIANS WITH EXPERTISE IN DIVING MEDICINE

A List of Medical Doctors that have training and expertise in diving or undersea medicine can be found through the Undersea and Hyperbaric Medical Society or Divers Alert Network. See links below

<https://www.uhms.org/resources/diving-medical-examiners-list.html>

<https://www.diversalertnetwork.org/medical/physicians.asp>

1. Name: Dr. Sam Miller IV

Address: MMC Emergency Physician Medical Grp.
1400 E. Church St, Santa Maria, CA 93454

Phone: (714) 390-7650 (Mobile)

2. Name: Dr. Steven Sabo

Address: Pacific Central Coast Health Center Dignity Cuesta
1555 Higuera St., San Luis Obispo, CA 93401

Phone: (805) 543-2324

Classification of divers based on severity of COVID-19 suspected illness

| Category 0 <i>NO history of COVID-19 suspected illness</i> | Category 1 MILD <i>COVID-19-suspected illness</i> | Category 2 MODERATE <i>COVID-19-suspected illness</i> | Category 3 SEVERE <i>COVID-19-suspected illness</i> |
|---|--|---|--|
| <p>Definition: Divers who have no history of COVID-19 suspected illness should proceed with normal evaluations. Additionally, we would use these criteria in those who may have had a positive screening PCR or antibody test, but without any history of illness or symptoms consistent with COVID-19.</p> | <p>Definition: <ul style="list-style-type: none"> ● Did not seek health care or received outpatient treatment only without evidence of hypoxaemia. ● Did not require supplemental oxygen ● Imaging was normal or not required </p> | <p>Definition: <ul style="list-style-type: none"> ● Required supplemental oxygen or was hypoxic ● Had abnormal chest imaging (chest radiograph or CT scan) ● Admitted to the hospital but did NOT require mechanical (intubation) or assisted ventilation (BIPAP, CPAP) or ICU level of care. ● If admitted, had documentation of a normal cardiac work up including normal ECG and cardiac biomarkers e.g. troponin or CK-MB and BNP </p> | <p>Definition: <ul style="list-style-type: none"> ● Required mechanical (intubation) or assisted ventilation (BIPAP, CPAP) or ICU level of care. ● Cardiac involvement defined as abnormal ECG or echocardiogram, or elevated cardiac biomarkers; e.g. troponin or CK-MB and BNP (or absence of documented work up) ● Thromboembolic complications (such as PE, DVT, or other coagulopathy) </p> |

Recommendations for evaluations of divers or diving candidates

| Category 0 <i>NO history of COVID-19 suspected illness</i> | Category 1 MILD <i>COVID-19-suspected illness</i> | Category 2 MODERATE <i>COVID-19-suspected illness</i> | Category 3 SEVERE <i>COVID-19-suspected illness</i> |
|---|--|---|---|
| <ul style="list-style-type: none"> ● Initial/periodic exam per AAUS guidelines ● Chest radiograph only if required per professional group ● No additional testing required | <ul style="list-style-type: none"> ● Initial/periodic exam per AAUS guidelines ● Spirometry ● Chest radiograph (PA & lateral); if abnormal, obtain chest CT ● If unknown (or unsatisfactory) exercise tolerance*, perform exercise tolerance test with oxygen saturation | <ul style="list-style-type: none"> ● Initial/periodic exam per AAUS guidelines ● Spirometry ● Chest radiograph (PA & lateral); if abnormal, obtain chest CT ● ECG ● Echocardiogram (if no work up was done as an inpatient. Can forgo if had negative work up) ● If unknown (or unsatisfactory) exercise tolerance*, perform exercise tolerance test with oxygen saturation ● Investigation and management of any other complications or symptoms per provider and professional group or RSTC guidelines | <ul style="list-style-type: none"> ● Initial/periodic exam per AAUS guidelines ● Spirometry ● Chest radiograph (PA & lateral); if abnormal, obtain chest CT ● ECG ● Repeat cardiac troponin or CK-MB and BNP to ensure normalization ● Echocardiogram ● Exercise Echocardiogram with oxygen saturation ● Investigation and management of any other complications or symptoms per provider and professional group or RSTC guidelines |

* If the physician is not assured the diver's self-reported exercise level meets appropriate criteria or is concerned it would not reveal underlying cardiac or pulmonary disease, further testing is warranted.

Adapted from : Charlotte Sadler, Miguel Alvarez Villela, Karen Van Hoesen, Ian Grover, Michael Lang, Tom Neuman, Peter Lindholm. Diving after SARS-CoV-2 (COVID-19) infection: Fitness to dive assessment and medical guidance. Diving and Hyperbaric Medicine. 2020 30 September;50(3). doi: 10.28920/dhm50.3

Cal Poly/AAUS COVID-19 DIVER QUESTIONNAIRE

NAME: _____ **DOB:** _____ **DATE:** _____

COVID-19 SYMPTOMS:

Please circle

Since January 2020:

- | | | |
|--|----|-----|
| 1. Have you had a positive swab (PCR) or blood (antibody test) for COVID-19? If YES, date of test(s): _____ | No | Yes |
| 2. Have you had any of the following symptoms? (circle all that apply) cough, shortness of breath, difficulty breathing, fever, chills, shivering, muscle aches, headache, sore throat, loss of taste or smell, diarrhea | No | Yes |
| 3. Did you miss any days of work due to the above symptoms? | No | Yes |
| 4. Have you had severe respiratory illness with clinical or x-ray evidence of pneumonia, or acute respiratory distress syndrome? | No | Yes |
| 5. If YES to question 2-4, were you diagnosed with any respiratory illness other than COVID-19? If YES, what illness: _____ | No | Yes |
| 6. Are you having any symptoms currently? | No | Yes |
| 7. Do you feel anxious or depressed about the COVID-19 pandemic or working? | No | Yes |

EXERCISE TOLERANCE:

1. What is your normal exercise routine? - _____

- | | | |
|---|----|-----|
| 2. Any change in your ability to do your normal exercise or exertion? | No | Yes |
|---|----|-----|
3. If YES to question 2, why can't you do your normal exercise? _____

Stop here if you answered no to all above questions.

| HEALTHCARE: | | |
|---|----|--|
| 1. Did you seek healthcare related to the symptoms you experienced above? | NO | YES, what level of healthcare? <input type="checkbox"/> Outpatient <input type="checkbox"/> Hospital admission <input type="checkbox"/> Intensive Care Unit |
| 2. Did you have a low blood oxygen level or require supplemental oxygen? | NO | YES |
| 3. Was a chest x-ray or CT scan done? | NO | YES, it was: <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal |
| 4. Did you require assisted ventilation (BiPAP, CPAP, ventilator)? | NO | YES |
| 5. Was an evaluation of your heart done (EKG, echocardiogram, blood tests)? | NO | YES, it was: <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal |
| 6. Did you have any blood clots or blood clotting problems? | NO | YES |