

KAUST DIVING MEDICAL EXAM PACKAGE

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PHYSICIAN REFERENCE CHECK LIST

This checklist is provided as a quick reference to assist the examining physician in completing the KAUST Scientific Diving Medical Examination. It summarizes the mandatory assessment requirements for baseline and annual examinations and should be used to verify that all required clinical evaluations, investigations and supporting documentation have been completed prior to determining the applicant's fitness to dive.

BASELINE DIVING MEDICAL (Required for all new divers)
☐ Medical History Questionnaire ☐ Comprehensive Physical Examination ☐ All mandatory investigations completed ☐ CBC ☐ Urinalysis ☐ Audiometry ☐ Spirometry (PFT) ☐ Chest X-ray ☐ Resting ECG ☐ Exercise Capacity Test (Harvard Step Test, Chester Treadmill Walk Test, Bruce Protocol, or equivalent) ☐ Additional investigations if clinically indicated ☐ Medical fitness determination completed

ANNUAL DIVING MEDICAL (Required for returning divers)
☐ Medical History Questionnaire ☐ Comprehensive Physical Examination ☐ All investigations completed ☐ CBC (if clinically indicated) ☐ Urinalysis ☐ Audiometry ☐ Spirometry (PFT) ☐ Chest X-ray (if clinically indicated) ☐ Resting ECG (≥ 40 years) ☐ Exercise Capacity Test (Harvard Step Test, Chester Treadmill Walk Test, Bruce Protocol, or equivalent) ☐ Additional investigations if clinically indicated ☐ Medical fitness determination completed

KAUST DIVING MEDICAL EXAM PACKAGE

This package consists of the following:

1. Medical Exam Overview for divers and instructions for clearance process
2. Information for examining clinicians
3. Medical Evaluation Fitness for SCUBA Diving Form (clinician completes, form for results of exam)
4. Diving Medical History Form (applicant completes)
5. Consent form, Applicant's Release of Medical Information Form

1. Medical Exam Overview & fitness to dive clearance process

Diving makes considerable demands on your physical health. Diving in the presence of certain medical conditions may pose significant risks not only for yourself but to others you will dive with. Therefore, it is prudent to meet certain medical and physical requirements before beginning your diving at KAUST.

Verification of physical fitness for diving must be completed BEFORE you can dive in KAUST programs. Medical clearance is required before approval for diving is given. KAUST Occupational Health department supports the medical surveillance program for KAUST divers. The following table summarizes the requirements for clearance for all diving classes.

2. Information for examining clinicians

Diving involves risk and certain medical conditions can make the risk of death and/or injury or illness while diving much higher. Scientific divers require periodic diving medical examinations to assess their fitness to engage in diving. Their answers on the **Diving Medical History Form** may indicate potential health or safety risks as noted. Diving is an activity that places unusual stress on the individual in several ways. Your evaluation is requested on this **Medical Evaluation Fitness for SCUBA Diving Form**. Your opinion on the applicant's medical fitness is requested. Scuba diving requires heavy exertion; hence 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. If you have questions regarding the medical findings of the applicant, please contact the Occupational Health team at occupational.health@kaust.edu.sa.

The patient requires a medical examination to assess their fitness to dive at KAUST. He/she should have completed a medical history form and should present it to you for review at the time of the examination.

To assist you in making this evaluation, this packet includes:

1. A "Diving Medical Evaluation Fitness for SCUBA Diving Report" form (to be completed and signed by you)
2. A "Diving Medical History Form" (to be completed by the applicant)
3. An "Applicant's Release of Medical Information Form" (to be completed by the applicant)
4. Information regarding potential disqualifying conditions including appropriate references and a list of all the required tests and recommended testing based on your findings (see below).
5. The Mandatory testing requirements for clinicians in accordance with the National Council for Occupational Safety and Health

Any questions regarding the exam can be addressed to the Occupational Health Specialist at occupational.health@kaust.edu.sa.

KAUST DIVING MEDICAL EXAM PACKAGE

Required BASELINE AND ON ALL DIVERS. All clinical tests must be attached to the submission.

All Divers Baseline

- Medical History Questionnaire
- Comprehensive Physical Examination (with emphasis on cardiac, pulmonary, neurological and otological systems)
- Complete Urinalysis (HbA1C if abnormal)
- Complete Blood Count (if clinically indicated)
- Audiometry (eardrum function & equalization)
- Spirometry (pulmonary function test)
- Chest X-ray
- Resting Electrocardiogram (ECG)
- Exercise Capacity Test (minimum MET level of 12, Harvard Step Test or Chester treadmill walk test or Bruce protocol or equivalent)
- Detailed assessment of coronary artery disease risk factors using Multiple-Risk-Factor Assessment, [Framingham Risk Assessment](#) (age, family history, lipid profile, blood pressure, diabetic screening, smoking history). Further cardiac screening (exercise test) may be indicated based on risk factor assessment
- If clinically indicated,
 - Post-exercise PEF or FEV1
 - Sick cell test
 - Any additional investigations deemed necessary by the examining physician

Required ANNUALLY ON ALL DIVERS. All clinical tests must be attached to the submission.

All Divers Annually

- Medical History Questionnaire
- Comprehensive Physical Examination (with emphasis on cardiac, pulmonary, neurological and otological systems)
- Complete Urinalysis (HbA1C if abnormal)
- Complete Blood Count (if clinically indicated)
- Audiometry (eardrum function & equalization)
- Spirometry (pulmonary function test)
- Chest X-ray (only if clinically indicated)
- CBC (if clinically indicated)
- Exercise Capacity Test (minimum MET level of 12, Harvard Step Test or Chester treadmill walk test or Bruce protocol or equivalent)
- Resting ECG (required for divers aged **40 years and older**)
- Detailed assessment of coronary artery disease risk factors using Multiple-Risk-Factor Assessment, [Framingham Risk Assessment](#) (age, family history, lipid profile, blood pressure, diabetic screening, smoking history). Further cardiac screening (exercise test) may be indicated based on risk factor assessment
- If clinically indicated,
 - Post-exercise PEF or FEV1
 - Sick cell test

KAUST DIVING MEDICAL EXAM PACKAGE

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

REFERENCES

1. **National Council for Occupational Safety and Health (NCOSH).** *National Occupational Safety and Health Standards (OSH Standards)*. Kingdom of Saudi Arabia. Current edition. (Occupational Health Services, Medical Surveillance, Fitness for Work and Health Monitoring requirements.)
2. **Ministry of Human Resources and Social Development (MHRSD).** *Executive Regulations for Occupational Safety and Health*. Kingdom of Saudi Arabia.
3. **Saudi Personal Data Protection Law (PDPL)** and Implementing Regulations. Saudi Data & Artificial Intelligence Authority (SDAIA).
4. ¹Grundy, 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>
5. American College of Cardiology/American Heart Association. **ASCVD Risk Estimator Plus.**
6. **Undersea and Hyperbaric Medical Society (UHMS).** Medical Evaluation of Recreational Divers. Current guidance.
7. **Divers Alert Network (DAN).** Health and Fitness to Dive Guidelines. Current edition.
8. **Association of Diving Contractors International (ADCI).** Consensus Standards for Commercial Diving and Underwater Operations. Current edition.
9. **American Academy of Underwater Sciences (AAUS).** Standards for Scientific Diving Certification and Operation of Scientific Diving Programs. Current edition.
10. **European Diving Technology Committee (EDTC).** Medical Assessment of Working Divers. Current edition.
11. **American Thoracic Society/European Respiratory Society.** Standardisation of Spirometry. Current standards.
12. **American College of Sports Medicine.** ACSM's Guidelines for Exercise Testing and Prescription. Current edition.

KAUST DIVING MEDICAL EXAM PACKAGE

MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT **PHYSICIAN TO COMPLETE**

Applicant name:	Date of birth:
Assessing Physician name:	Assessing Physician email:
Clinic Name & Address:	Clinic Phone:

TO THE EXAMINING PHYSICIAN: This person is an applicant for training or is presently certified to engage in diving with self-contained underwater breathing apparatus (SCUBA). Scientific divers require periodic SCUBA diving medical examinations to assess their fitness to engage in diving with SCUBA. Your opinion on the applicant's medical fitness is requested. 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. 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. If you have questions about diving medicine, please consult with the Undersea Hyperbaric Medical Society or Divers Alert Network. If you have questions regarding the medical findings of the applicant, please contact the Occupational Health team at occupational.health@kaust.edu.sa.

PHYSICIAN'S STATEMENT:

I have evaluated the above-mentioned individual according to the tests listed above, in my opinion, find no medical conditions that may be disqualifying for participation in SCUBA diving. 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.

☐ Baseline Diving Examination	☐ Annual Dive Examination
☐ Diver is medically qualified to dive for one year	
Diver is not medically qualified to dive:	☐ Permanently ☐ Temporarily, explain:

MD or DO signature:	Date of exam:
My familiarity with applicant is ☐ This exam only	☐ Regular physician for ____ years
My familiarity with diving medicine is:	

KAUST DIVING MEDICAL EXAM PACKAGE

APPLICANT'S RELEASE OF MEDICAL INFORMATION FORM **APPLICANT TO COMPLETE**

Patient name:	Date of exam:
Assessing Physician:	
Clinic Name & Address:	Clinic Phone:

I authorize the release of this information and all medical information subsequently acquired in association with my diving to the Occupational Health Department at (place) _____ on (date) _____ for purposes of determining my fitness to dive for KAUST. I authorized the Occupational Health Team and/or the assessing doctor to discuss my fitness to dive and medical findings of my assessment.

Patient Signature:	Date:
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KAUST DIVING MEDICAL EXAM PACKAGE

DIVING MEDICAL HEALTH HISTORY FORM **APPLICANT TO COMPLETE**

Patient name:	Sex	Date of Birth	Weight	Height
Assessing Physician:				
Clinic Name & Address:			Clinic Phone:	

TO THE APPLICANT:

Scientific scuba diving places significant physical and physiological demands on the body and requires a high level of physical and mental fitness. In accordance with the Kingdom of Saudi Arabia National Council for Occupational Safety and Health (NCOSH) Occupational Fitness requirements and KAUST Occupational Health Program requirements, all individuals participating in KAUST scientific diving activities must undergo a medical fitness assessment before commencing diving activities and at the required periodic intervals. This Medical History Form forms an essential part of your occupational fitness evaluation. Your responses will assist the examining physician in identifying any medical conditions that may affect your ability to safely perform scientific diving activities or increase the risk of injury or illness to yourself or others. Please answer all questions accurately and completely. Your responses, together with the physical examination and any required investigations, will be used by the examining physician to determine your fitness for scientific diving. Additional medical information or specialist assessment may be requested if required. Your medical information will be treated confidentially and managed by KAUST Occupational Health in accordance with the Saudi Personal Data Protection Law (PDPL). If a medical condition is identified that may affect your ability to dive safely, you may be found fit, fit with restrictions, temporarily unfit, or permanently unfit for scientific diving. These determinations are made to protect your health and safety and that of other members of the diving team.

	Yes	No	Please indicate whether 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			Are you currently taking any prescription medications, over-the-counter medications, herbal medicines or supplements	
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	

KAUST DIVING MEDICAL EXAM PACKAGE

Patient name:				
	Yes	No	Please indicate whether or not the following apply to you	Comments
20			Alcoholism	
21			Any problems related to diving	
22			Nervous tension or emotional problems	
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	

KAUST DIVING MEDICAL EXAM PACKAGE

Patient name:				
	Yes	No	Please indicate whether the following apply to you	Comments
54			Heart murmur	
55			Large heart	
56			High blood pressure	
57			Angina (heart pains or pressure in the chest)	
58			Heart attack	
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/ Additional vaccination dates	
81			Obstructive Sleep Apnea	
82			Excessive daytime sleepiness	
83			Narcolepsy	

KAUST DIVING MEDICAL EXAM PACKAGE

Occupational History

Patient name:				
	Yes	No	Please indicate whether the following apply to you	Comments
1			Have you previously worked as a professional, scientific or commercial diver	
2			Have you ever been declared medically unfit or restricted from diving or another safety-sensitive occupation	
3			Have you ever failed an occupational medical examination	
4			Have you ever suffered a diving-related injury requiring medical treatment	
5			Have you ever been exposed to High noise levels	
6			Have you ever been exposed to Chemicals	
7			Have you ever been exposed to Confined spaces	
8			Have you ever been exposed to Hyperbaric work	
9			Have you ever been exposed to Extreme heat	
10			Have you ever been exposed to Respiratory hazards	

Please explain any "yes" answers to the above questions.

Question number	Comment

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

Patient Signature:	Date:
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KAUST DIVING MEDICAL EXAM PACKAGE

MEDICAL EXAMINATION REQUIREMENTS:

National Regulation for Occupational Fitness Examination

Physical Examination	Normal	Abnormal	Comments
Height, Weight, BMI			
Pulse, BP, Temperature			
Visual Acuity; aided/unaided			
Visual Fields, Color vision			
Hearing			
Physical Examination			
General appearance			
Pallor			
Edema			
Jaundice			
Heart (rhythm, sound, murmurs)			
Cognitive functions			
Psychiatric (appearance, behavior, mood, thoughts and communication, memory)			
Mouth, teeth			
Ears, nose, throat			
Lung and Chest (not including breast exam)			
Abdomen (including organomegaly, and hernia)			
Urinary and genital systems (not including pelvic exam)			
Upper and lower extremities (strength and range of motion)			
Spine			
Neurological (Equilibrium, tendon reflexes, coordination, etc.)			
Skin			
Posture			
Gait			
Balance			
Involuntary movements			
Speech			
Varicose Veins			
Cranial Nerve 11-X11			

KAUST DIVING MEDICAL EXAM PACKAGE

Recommended Physicians with Specialty/Expertise in Diving Medicine in KSA

Name: Dr. Ahmed Ali Mohamed Ali Abdeldayem	Hospital: Dr. Soliman Fakeeh Hospital Al-Hamra'a, Jeddah 23323, Saudi Arabia
Name: Dr. Mohammed Masad Al Sheri	Hospital: Dr. Soliman Fakeeh Hospital Tabuk, NEOM Hospital, NEOM Bay
Name: Dr. Ahmed Aljefri	Hospital: KAUST Health International Medical Center, 4700 King Abdullah University of Science and Technology Thuwal 23955-6900