SARS-CoV-2 and fitness to dive guidance

Background

Coronavirus disease (COVID-19) has become a global pandemic with SARS-CoV-2 infecting millions of people worldwide. With regard to diving and infection, we are particularly concerned about the effects post infection on the respiratory and cardiovascular systems. In order to support the health and safety of our scientific divers, it is within our duty to refer a scientific diver who has had a COVID-19 infection for fitness to dive re-assessment. In accordance with AAUS (American Academy of Underwater Sciences) standards DAN (Divers Alert Network) standards the following guidance has been developed.

Guidance and scope

This directive covers fitness to return to research diving guidance after a confirmed COVID-19 infection. It contains recommendations for the assessment of fitness for diving duties for all KAUST (King Abdullah University of Science and Technology) scientific divers and visiting divers during the ongoing COVID-19 pandemic. It pertains to all scientific divers participating in scientific diving operations under the auspices of a KAUST scientific diving program and includes scientific diving anywhere in the world. The assessment of all KAUST scientific divers is necessary to identify potential pulmonary and cardiac changes in those who contracted the disease.

Medical standard

Scientific divers diagnosed with COVID-19 are recommended to have proper lung functions prior to returning to diving. Regardless of when they became infected and their clinical presentation (asymptomatic, mild, moderate, or severe) if a scientific diver has past COVID-19 infection he/she are recommended to have a fitness to dive re-assessment by a hyperbaric medicine/diving doctor (where reasonably possible) prior to returning to diving. If a scientific diver has had COVID-19 infection, scientific diving can take place after recovery and the chest x-ray and spirometry tests are normal. The following guidelines are intended for the evaluation of scientific divers who had a COVID-19 illness, are currently asymptomatic, and have subjectively returned to their baseline exercise tolerance.

All medical evaluations required by this directive shall where reasonably possible be performed by a licensed physician hyperbaric medicine/diving doctor.

Severity of illness	Fitness testing to be performed
No known history of illness	Proceed with normal evaluations, no additional testing required. Initial/recurrent exam per AAUS guidelines
Asymptomatic and/or Mild illness: • Did not seek health care or received outpatient treatment only without evidence of hypoxemia. • Did not require supplemental oxygen. • Imaging was normal or not required.	Initial/periodic exam by specialist of hyperbaric medicine/diving doctor Spirometry Chest X-ray (PA and lateral) Chest CT, if abnormal chest X-ray If unknown or unsatisfactory exercise tolerance, performing exercise tolerance test with oxygen saturation
Moderate illness: • 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.	Initial/periodic exam by specialist of hyperbaric medicine/diving doctor Spirometry Chest X-ray (PA and lateral) Chest CT, if abnormal chest X-ray Electrocardiogram Echocardiogram If unknown or unsatisfactory exercise tolerance, performing exercise tolerance test with oxygen saturation Investigation and treatment of any other complications by specialist of hyperbaric medicine/diving doctor

• Admitted and had normal cardiac work up including normal ECG and cardiac biomarkers**.**	
Severe illness: • 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. • Thromboembolic complications (such as pulmonary embolism, DVT, or other coagulopathy).	Initial/periodic exam per (ADCI/AAUS/NOAA/RSTC) by specialist of hyperbaric medicine/diving doctor Spirometry Chest X-ray (PA and lateral) Chest CT, if abnormal chest X-ray Electrocardiogram Repeat cardiac biomarkers (troponin or CK-MB and BNP) to ensure normalization Echocardiogram Exercise echocardiogram with oxygen saturation Investigation and treatment of any other complications by specialist of hyperbaric medicine/diving doctor and per ADCI/AAUS/NOAA/RSTC guidelines

Definitions:
AAUS: American Academy of Underwater Sciences
ADCI: Association of Diving Contractors International
Diagnosed with COVID-19: either by clinical diagnosis and/or antigen/PCR testing. **(ADD PHA guidance)**
NOAA: National Oceanic and Atmospheric Administration
RSTC: World Recreational Scuba Training Council
Scientific diving:
Diving performed solely as a necessary part of a scientific, research, or educational activity by employees (including students and faculty) and visiting scientific divers whose sole purpose for diving is to perform scientific research tasks.

References:
UC San Diego Guidelines for Evaluation of Divers during COVID-19 pandemic
Undersea and Hyperbaric Medical Society
AAUS
DAN
Diving and Hyperbaric Medicine Volume 50 No. 3 September 2020

Dive medical/hyperbaric medicine specialist in KSA:

Dr. Ahmed Ali Abdeldayem

Dr. Ikhtiar Hussain