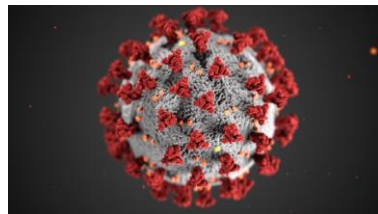




# COVID-19 GUIDANCE FOR SURFACE DIVING OPERATIONS





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## 1 PURPOSE

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Health and safety are among the core values of ADCI. It is an important objective for ADCI to avoid incidents in the workplace and elsewhere regarding the COVID-19 outbreak. The roles and duties of protecting an individual's health are broad and affect many areas of project planning, execution, and follow-up.

The ADCI would like to thank Oceaneering International and the ADCI Physicians Diving Advisory Committee for their input and guidance in the creation of this document.

This is an evergreen document which will be revised and updated as additional medical information and recommended safe practices become available.

## 2 SCOPE

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This document provides direction from ADCI'S medical advisors with the most recent best practices, for dive planning, elimination of cross contamination with diving equipment, and testing of divers prior to commencing work in the capacity of a diver who will enter the water.



**NOTE!!!**

All divers, and tenders who will make a dive need to be pre-screened prior to every job they are assigned to. Failure to be pre-screened eliminates their ability to make a dive.

## 3 DEFINITIONS

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Term	Definition
CDC	Center for Disease Control
ADCI	Association of Diving Contractors International
JSEA	Job Safety Environmental Analysis
LSR	Life-Saving Rule
HSE	Health, Safety & Environment
PUI	Person-Under-Investigation: any crewmember begins exhibiting fever, cough, or shortness of breath, the Person-Under-Investigation (PUI) should have their temperature monitored throughout the day.
ACOEM	American College of Occupational and Environmental Medicine



4 REFERENCES

Document Number	Document Title
OII	COVID-19 Guidance for Surface Diving Operations
ADCI	International Consensus Standards for Commercial Diving and Underwater Operations
UC San Diego	UC San Diego Study on Evaluation of Divers during COVID-19 Pandemic

5 ROLES AND RESPONSIBILITIES

Roles and responsibilities in this section are defined by this guidance, for a full list of roles and responsibilities reference section 02 Diving Organizational Roles and Responsibilities in the Oceaneering Diving Operations Manual 801058238.

Role	Description	Responsibilities
HSE	HSE is responsible for updating.	<ul style="list-style-type: none"> <li>It is the responsibility of the HSE dept. to ensure that procedures and processes are regularly reviewed and updated to capture any changes in legislation, and guidance or to communicate relevant changes to implement in existing documentation</li> </ul>
Global Mobility	Overall responsibility for delivering the requirements for the risk management strategy.	<ul style="list-style-type: none"> <li>It is the responsibility of the Diving Manager to ensure that COVID-19 procedures and processes are followed during mobilization of personal</li> <li>They shall be familiar with this report and contents to assist in assessing COVID-19 risk during the mobilization and demobilization of personnel from projects</li> <li>Work with Project Managers, Operations Managers and Equipment Managers for proper staffing of diving personnel and appropriate Journeymen Plans are in place</li> </ul>
Diving Operations Manager	Is responsible for ensuring this guidance is updated according to policies and industries best practices. Is also responsible for the dissemination of this guidance to employees.	<ul style="list-style-type: none"> <li>It is the responsibility of the Diving Manager to ensure that diving procedures and processes are regularly reviewed and updated to capture any changes in legislation, or to clarify any areas that are not clear in the existing documentation ensure that all the information communicated “rolled out”</li> <li>He shall be familiar with this report and contents to assist in assessing risks during the implementation of changes</li> <li>Work with Project Managers, Superintendents and Equipment Managers for competent staffing of diving personnel and journeyman plans</li> </ul>

Role	Description	Responsibilities
OCM, Superintends,	Are responsible for ensuring this procedure is disseminated across projects and interface with Marine dept. on COVID-19 protocols.	<ul style="list-style-type: none"> <li>To accurately complete a COVID-19 self-verification assessment and report findings in a timely manner</li> <li>To accurately report thru process any COVID-19 incidents and understand project response plan</li> </ul>



Supervisors		<ul style="list-style-type: none"> <li>• He shall be familiar with this report and contents to assist in the reduction of incidents in the workplace and elsewhere regarding the COVID-19 outbreak</li> <li>• Accountable for PPE and sanitizing agents, issuing to crews for prevention of exposure to the COVID-19 virus</li> <li>• Ensure disposals of materials that maybe affected with the virus</li> </ul>
Diving Technicians	Are responsible for ensuring this guidance is read, comprehended, applied, and report any improvements that are recognized.	<ul style="list-style-type: none"> <li>• Responsible for dive helmet maintenance cleaning should be familiar appropriate cleaning methods and agents</li> <li>• Responsible for chamber maintenance cleaning should be familiar appropriate cleaning methods and agents, fitment of extra BIBS, and overall function of chambers</li> <li>• Ensure all changes to equipment is captured via a MOC and proper testing completed</li> </ul>
Employees	Are responsible for ensuring this guidance is read, comprehended, applied, and report any improvements that are recognized	<ul style="list-style-type: none"> <li>• Accountable for accurately reporting illness and or symptoms in a timely manner</li> <li>• To accurately complete a COVID-19 self-verification assessment and report findings in a timely manner</li> <li>• To accurately complete a COVID-19 response plan questionnaire and report finding in a timely manner</li> <li>• He shall be familiar with this policy and contents to assist in the reduction of incidents in the workplace and elsewhere regarding the COVID-19 outbreak</li> <li>• Accountable for PPE in the prevention of exposure to self and other of the COVID-19 virus. And application of the information here in</li> </ul>

## 6 SAFETY REQUIREMENTS & CONSIDERATIONS

### 6.1 GENERAL PROTOCOLS

It is important that each project follows COVID-19 protocols and integrate into project response plan that Includes:

- Verifying crew members are not infected before mobilization and during project execution. This may entail monitoring the prospective crew for several days prior to mobilization and presenting that information before mobilization of the vessel.
- A means and equipment to deal with a possibly infected individual to prevent the spread to other crew members i.e. quarantine/hospital room, medical supplies, cleaning supplies to decontaminate the area that the individual has occupied, personal dive hats in lieu of company hats.
- The supplies and training to not only care for an individual, but administer medical procedures considered standard for treating COVID-19. Example is a qualified medic and telemedicine.



- Evacuation plan should an individual's condition worsen such as dock facility and or medevac via boat or helicopter.
- Daily ongoing procedures to reduce the risk of exposure to the crew to include but not limited to social distancing, personal hygiene, and vessel cleanliness/sterilization. The number of berths and individuals per berth shall be clearly stated prior to mobilization.
- Verifying an infected individual is not brought to the vessel during the project. This may include monitoring of individual several days before they are brought offshore.
- Deny boarding of a passenger or crew member who is suspected to have COVID-19 infection based on signs and symptoms, plus recent travel history.
- Verifying that items such as groceries or project tools and equipment are not contaminated.

## 6.2 JOURNEY PLANS

International travel plans will have to consider countries' restrictions and quarantine periods and facilities to complete those periods, airline travel and requirements for PPE. Traveling personal are recommended to copy International ISOS information prior to departure.

Local mobilization of dive crews will require more diligent planning on mobilization of personnel to the vessel.

Risk of a whole crew being exposed during transportation needs to be risk assessed and a plan in place prior to mobilization "staggered" crew mobilization limiting the numbers in vans and carry all at one time allows for the marine to complete the onboarding process in an efficient manner without the possibility of exposing the whole drive crew to possible exposures to unknown or suspected personnel. Other guidelines include but are not limited to:

- Staggered mobilizations of personnel.
- Do not eat or drink during travel while in vans
- Wash hands after travel immediately upon arrival
- Sanitize bags and gear and do not store on floors and/or ground.

## 6.3 SCREENING OF DIVERS

Plan for divers to be screened prior to every project. The entire crew will not be screened, only those divers and tenders that will be entering the water and having close contact due to the nature of the work.

Diving operations, and global mobility will arrange the process to ensure that if a diver or third-party diver test positive they will be immediately quarantined, and steps will be taken to ensure that they do not encounter the remainder of the crew. We expect as time progresses that this policy will change. It is in the interest of everyone's health safety as we move forward with the rest of the country that these provisions are being put in place.

**For additional guidance please refer to the Vessel COVID-19 Response Plan in the appendices of this document.**



Role	Responsibilities and Process
Pre-Job Screening	<ul style="list-style-type: none"><li>• Global mobility to administer a COVID-19 self-verification assessment and report findings in a timely manner.</li><li>• Global mobility to administer a COVID-19 response plan questionnaire and report findings in a timely manner.</li></ul>
Pre-Job Testing	<ul style="list-style-type: none"><li>• Global mobility to administer a COVID-19 pre-job testing for personnel with hyperbaric physician a minimum of 48 hours prior to mobilization to the vessel and not more than 7 days in advance of mobilization to the vessel.</li></ul>
Vessel Arrival	<ul style="list-style-type: none"><li>• All vessels have been provided an Exergen Temporal Thermometer for use and additional touchless thermometers have been shipped.</li></ul>
Shift Turnover	<ul style="list-style-type: none"><li>• Dive crews will be monitored prior to coming on shift by checking individual's temperature. This will be done by medic or on coming DMT. These findings are to be documented on the shift turnover logs with name of individual, temperature, and time.</li></ul>

#### 6.4 “BUBBLE ROSTER” AND SOCIAL DISTANCING

A “Bubble Roster” is to create workgroup bubbles to minimize exposure to individuals outside of the bubble.

Examples of these bubbles are:

- Dive crew should only be in contact with the dive crew
- Work crew should only be in contact with work crew
- Boat crew should only be in contact with boat crew
- Galley crew should only be in contact with galley crew except when serving crew meals with acceptable distancing practices.

Other methods are to limit number of people in the galley at mealtime to less than 10 with staggered mealtimes.

Every other seat in the galley shall be left open as a minimum to provide a level of separation between individuals and no one should be sitting directly across the table from another individual. A sign with these instructions shall be posted at the entrance to the galley line and at the end of the line.

Subject to vessel POB limits and project manning requirements consideration will be made to limit the number of POB per room and ensure anyone staying in the same room will be working on the same shift and bubble roster limiting exposures to other personnel.

Close the gallery except at mealtime to limit traffic. Also consider closing off, or limiting access, to common areas such as TV rooms or gyms.

#### 7 HYGIENE



Hygiene plays an important role in the prevention and spread of the COVID-19 virus.

**7.1 HYGIENE MEASURES**

**7.1.1 Approved Disinfectant Solution**

Confidence Plus solution disinfectant has the power to kill dangerous viruses, bacteria, and fungi at dilutions as per manufacturer directions while remaining stable, non-irritant, non-hazardous, non-corrosive, non-tainting, non-staining, biodegradable at full strength, and within compliance for use in against the COVID-19 VIRUS.

The American Chemistry Council’s (ACC) Center for Biocide Chemistries (CBC) has compiled a list of products that have been pre-approved by the U.S. Environmental Protection Agency (EPA) for use against emerging enveloped viral pathogens and can be used during the 2019 novel coronavirus (COVID-19) outbreak.

**7.1.2 Disposal Routines**

Personnel handling items emanating from a chamber containing an infected patient, either through routine medical lock or other chamber operations, will also require the apron, medical gloves and mask all cleaning materials used should be discarded in plastic bags and if in the chamber to be sent out through the medical lock.

**7.1.3 Disinfectant Routines**

Records of cleaning activities should be logged and retained. The US Navy recommends the use of MadaCide FD for diver- worn Equipment and the use of MadaCide 1 for interior disinfecting of chambers and locks. MadaCide disinfectant is a more aggressive disinfectant and requires less time for cleaning. MadaCide FD is a “fast drying” agent and no wiping or rinsing is required. Once the agent is applied and allowed to dry the component is ready for use. This agent is recommended for use on all dive helmets, BIBS, and mattresses (Surface Diving Decompression Chamber). MadaCide 1 is recommended for use on all interior surfaces of chambers and med locks.

If diving helmets are to be stored for a period of **more than 1 Hour**. They are to be stored in a separate dedicated area to prevent any “accidental” contamination between cleanings.

Item ITEM	Saturation Diving		Surface Diving	
	FREQUENCY	METHOD	FREQUENCY	METHOD
DIVING HAT AND SLS MOUTHPIECE ORAL-NASAL NECK DAM NOSE BLOCK HAT INTERIOR BIBS	AFTER EACH DIVE	Diver is to wash with <b>MadaCide FD</b> . Care should be taken as not to let solutions into helmet. Follow instructions in Section 12.2	AFTER EACH DIVE	Technician is to wash with <b>MadaCide FD</b> and allow the hat to dry. Follow instructions in Section 12.2
DIVING SUIT HAT LINER GLOVES UNDERSUIT CLOTHING	AFTER EACH DIVE	To be washed at 60 C and dried	AFTER EACH DIVE	To be washed at 60 C and dried
BEDDING	ONCE A WEEK (AS A MINIMUM)	All bedding shall be sent out before chamber cleaning. Clean tumble-dried bedding shall be	AFTER EACH DIVE	Technician is to wash mattress with <b>MadaCide</b>





		sent in after the chamber is cleaned.		<b>FD</b> and allow the mattress to dry. Follow Instructions in Section 12.2
<b>TABLE SURFACES MEDICAL LOCKS BUNK RAILES AND DOOR HANDLES WITHIN THE SAT CHAMBERS</b>	THREE TIMES A DAY	Diver is to wipe surfaces down with <b>MadaCide 1</b> . Following the instructions in Section 12.3	AFTER EACH DIVE	Diver is to wipe Chamber down with <b>MadaCide1</b> . Following the instructions in Section 12.3
<b>CHAMBER</b>	ONCE A WEEK (AS A MINIMUM)	Diver is to wipe surfaces down with <b>MadaCide1</b> . Following the instructions in Section 12.3	AFTER EACH DIVE	Diver is to wipe Chamber down with <b>MadaCide1</b> . Following the instructions in Section 12.3

The virus has a lipid envelope (fat membrane) surrounding it which is destroyed by detergent. This means hand washing is a very effective control of the virus picked up from touching contaminated surfaces.

>60% alcohol gel hand sanitizer is also an effective control but is not available for use in chambers. Correct hand washing technique is the prime control to prevent contamination.

## 8 RESPONSE

### 8.1 TIER 1

Tier 1: Monitor: Should any crewmember begin exhibiting fever, cough, or shortness of breath, the Person-Under-Investigation (PUI) should have their temperature monitored throughout the day. Should their temperature rise above 100.4 proceed to Tier 2 guidance.

### 8.2 TIER 2

Tier 2. Master should contact Marine Management as soon as the elevated temperature is confirmed to set up a caser. Crew should immediately begin wiping down all vessel surfaces with an antibacterial solution.

- \*If vessel is working overseas, contact ISOS clinic to set up a case.\*
- Domestically, case will go through the normal HSE Case Management Process.

## 9 ADDITIONAL CLEANING SUPPLIES, EQUIPMENT & PPE NEEDED

ITEM#	ITEM DESCRIPTION
1	Bleach, when mixed in solution or spray shall be a 9 equal parts water to one equal part bleach solution
2	Cleaning wipes, as defined from Kirby Morgan / Dive Lab



3	Approved masks for deck crew company supplied
4	Additional Bibs, hat liners, and Diving Helmets for rotational purposes
5	UV and ozone generator for cleaning of BIBS, and dive hat components
6	Nitrile gloves for handling Dive gear that will meet skin

## 10 DIVE PLANNING

The elevated PP02 levels in the body during diving or while under pressure is one of the prescribed treatment methods being used successfully for the treatment of COVID-19 patients.

The Divers will have been screened in accordance with section 6.3 above. All screening shall occur prior to the project and be reviewed by the diving operations manager or his designee.

No additional steps surrounding company approved dive tables is required. Diving practices surrounding bottom times, PP02 limits. Chamber times shall all remain the same.

## 11 ADDITIONAL DIVING EQUIPMENT

The wide scope of diving operations and variety of diving profiles from bell diver team manning to surface diving depth table and team make-ups. The numerical equipment to be used inevitably means that specific instructions for every situation and circumstance is not possible. These charts and recommendations to meet rotational requirements, however, form the basis from which every operation will develop its individual procedures applicable to that operation.

<b>Item</b>	<b>Saturation Diving</b>		<b>Surface Diving</b>	
<b>Item</b>	<b>2 Man Bell Team</b>	<b>3 Man Bell Team</b>	<b>Single Diver</b>	<b>2 Man Bell Team</b>
DIVING HAT	4 totals	6 totals	4 totals	6 totals
DIVING HAT LINER	6 totals	9 totals	12 totals	6 totals
BIBs Requirement based on Sur 'd' 02 for divers #1, #2			12 totals	6 totals
<b>PPE for Deck and Technicians and Support Personnel</b>				
Protective Masks	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120
Nitrile Gloves	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120
Aprons	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120	Crew size 24 minimum 120
<b>Additional Sanitation Equipment</b>				
Ozone/UV Filters	7	7	7	7
Hand Sanitizing	5	5	5	5

### 11.1 SHARING OF EQUIPMENT & ROTATION REQUIREMENTS



**CAUTION!**

Ensure all BIBS, QD's and hoses are not cross contaminated. We do not want to introduce contamination with this new requirement.

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- The rotational requirement of changing and cleaning dive hats, oral nasals, BIBS, and neck dams after each dive is required.
- The rotation/sharing of dive helmets will be dictated by the equipment group and the DTS and Dive Supervisor assigned to each job will ensure that the directives are carried out.
- If available, the cleaning process shall introduce the hat to a closed space that has UV filtered and Ozone generator. The amount of exposure time will be in accordance with the Mfg. recommended settings. The condition may be created whereby the reaction of the Ozone (O<sub>3</sub>) with contaminants (i.e., oxidation) causes material breakdown. The extent of the oxidation process is reduced by cleaning these materials before exposure to Ozone. Because of this, the Techs will have to closely monitor and share information with the Equipment Manager so additional steps can be taken.
- The single greatest point of contamination risk is via the dive hat and BIBS. Divers will be assigned hat liners they are responsible to keep clean and return when the project is complete.
- BIBS masks will be changed out every chamber run, and a robust supply shall be on hand to offset the deep cleaning required after each use. Every effort should be made to supply at least the same number of BIBS as divers to offset this burden. Divers will unplug BIBS from the out lock and carry the same BIB with them to the inner lock to continue Sur 'D' 02. This gap in time is not deemed a concern if kept under 30 seconds.
- Additional support such as telemedicine shall be in place in support of the medic. At a minimum a doctor, qualified to treat COVID-19, must be on call. A method to get a patient tested should be considered.



## 12 APPENDICES

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### 12.1 COVID-19 RESPONSE PLAN

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#### COVID-19 RESPONSE PLAN

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##### Introduction

- **Scope** – All Vessels and contracted Vessels
- **Purpose** – To provide guidance for master's & crews in COVID-19 prevention, screening, mitigation and ultimately, isolation and evacuation of personnel.
- **Definitions:**

**Isolation:** is used to separate ill persons who have a communicable disease from those who are healthy. Isolation restricts the movement of ill persons to help stop the spread of certain diseases. For example, hospitals use isolation for patients with infectious tuberculosis.

**Quarantine:** is used to separate and restrict the movement of well person who may have been exposed to a communicable disease to see if they become ill. These people may have been exposed to a disease and do not know it, or they may have the disease but do not show symptoms. Quarantine can also help limit the spread of communicable disease.

**Coronavirus disease (COVID-19):** is an infectious disease caused by a newly discovered severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2).

**COVID-19 Symptoms:** The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat, or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but do not develop any symptoms and do not feel unwell. Most people (about 80% recover from the disease without needing special treatment. Around 1 out of every 6 people who get COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention.

**Person-Under-Investigation (PUI):** Any person who is under investigation for having the virus that causes COVID-19, or who was under investigation but tested negative for the virus.

**Presumptive Positive:** A presumptive positive result is when a patient has tested positive by a public health laboratory at a local or state level, but results are pending confirmation at CDC.

**Laboratory-Confirmed Positive:** A confirmed positive result is when a patient has tested positive via a CDC approved Laboratory or test.



**Close Contact:** A close contact is a person who, for example:

- Has stayed in the same residence or cabin with a suspect/confirmed COVID-19 case.
- Has had closed contact within one meter or was in a closed environment with a suspect/confirmed COVID-19 case (for passengers this may include sharing a cabin).
- Participated in common activities on-board or ashore.
- Participated in the same immediate traveling group.
- Dined at the same table (for crew members this may include working together in the same ship area).
- Is a cabin steward who cleaned the cabin.
- Is a medical support worker or other person providing direct care for a COVID-19 suspected or confirmed case?

### Preparedness and Prevention

- **Screening** – Due to COVID-19 being so widespread and the possibility of being a carrier despite having no symptoms, all persons reporting to the vessel for work and remaining onboard, should have their temperatures monitored 3 times daily for the duration of their hitch/stay onboard. No Exceptions! All persons boarding the vessel should present the questionnaire upon arrival. If the person requesting access has recently traveled outside the Continental United States boarding the vessel should be denied. All vessels should be provided with an Exergen Temporal Thermometer for use and additional touchless thermometers have been shipped.
- **Enhanced Preventative Vessel Cleaning** – Mess areas, heads, handrails, door handles and all other items that people regularly touch or share should be cleaned with bleach or antibacterial solution daily. Aerosol sprayers with specialized antibacterial fluid should be ordered and supplied to vessel for enhanced vessel cleaning of all onboard spaces.
- **Hand washing and sanitizing expectations** - All personnel onboard are expected to wash their hands frequently. All heads should be supplied with anti-bacterial soap and hand washing instructions posters.

### Response

- **Tier 1: Monitor:** Should any crewmember begin exhibiting fever, cough, or shortness of breath, the Person- Under-Investigation (PUI) should have their temperature monitored throughout the day. Should their temperature rise above 100.4, go to Tier 2. The Master should contact marine management as soon as the elevated temperature is confirmed to set up a case. Crew should immediately begin wiping down the vessel surfaces with an antibacterial solution. \*If vessel is working overseas, contact ISOS clinic to set up a case. Domestically, the case will go through the normal HSE Case Management Process.
- **Tier 2: Quarantine:** The PUI should be quarantined to a stateroom. Personal contact should be limited to stewards delivering meals and medic/captain taking temperature readings; both of whom should be wearing N95 masks and gloves to prevent exposure. Should the IP need to exit the room, they should be wearing a face mask to protect the other crewmembers. Masters should work in concert with marine management to get the PUI to a doctor for evaluation and testing/treatment. Isolate ventilation if possible. HSE needs to be contacted immediately for a case to be opened and monitored. All other vessel personnel should be isolated from the PUI. Oxygen Bottles, size (H) should be shipped to the vessel(s).

### Masters Guidance



- **Tier 3: Treatment and Repatriation:** Should the PUI be a suspected Presumptive Positive, management should arrange medical transportation ASAP. If onshore, an ambulance service will be contacted. One transferred to a medical facility, HSE dept should continue to monitor the PUI's progress and diagnosis. The PUI's family will be notified and kept informed. If the PUI has a Laboratory-Confirmed Positive for COVID-19, the medical facility will then oversee the PUI's care. De-isolation will consist of a negative test, 14 days, or advice of medic & Medical Director in special circumstances. Should the person test negative, transportation should be arranged with HSE dept to repatriate the person back to their destination of origin. They should arrange care through their family physician. A full release should be required before returning to work on a Vessel.
- **Social Distancing:** Any personnel seeking to board the vessel for whatever reason, who are not going offshore for the job, should be confined to the back desk or guided down to the engine room space from access other than the accommodations. These personnel should be fed on the back desk and use the Port-O-Lets provided on the dock, and are not otherwise to enter the accommodation spaces. Social distancing should be practiced onboard wherever possible maintaining at least 3 feet or 6 feet if feasible. If job POB allows for it, personnel should be berthed in single rooms. All crews are required to follow social distancing while off and to follow local government directions on self-isolation. This should be confirmed prior to crew change.
- **Cloth Facial Coverings (masks):** Anyone coming to the vessel should be required to wear one for the first 14 days while they are inside the vessel. They are washable and reusable, so they should be returned after the 14-day period or upon departure from the vessel.
- Ensure they are cleaned properly according to the instructions in the package.
- Any "Day Workers" are encouraged to supply their own as our supplies will usually be limited. Neck gaiters are acceptable.
- Mealtimes should be structured so that groups who work together eat together, all non-essential personnel not sailing with the vessel should be provided food in Styrofoam containers to be eaten outside the accommodations.

### CDC Guidance on Homemade Cloth Face Coverings

- CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies), especially in areas of significant community-based transmission.
- CDC also advises the use of simple cloth face coverings to slow the spread of the virus and help people who may have the virus and not know it from transmitting it to others. Cloth face coverings fashioned from household items or made at home from common materials at low cost can be used as an additional, voluntary public health measure.
- Cloth face coverings should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the mask without assistance.
- The cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders as recommended by current CDC guidance.

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>



**Masters Guidance:**

- No Questionnaire; no boarding. This goes for everyone looking to board a Vessel.
- Use common sense and use every available incident/accident mitigation measure at your disposal to keep you and your crew safe.
- The Exergen Temporal Thermometers or Touchless Thermometers should be used for everyone boarding. Social distancing guidelines of 6 feet should be observed if a line forms at the gangway.
- An N95 mask needs to keep track of it as they will be in short supply.
- The quarantined person should have their meals delivered. The person delivering the meal will do so the nitrile/latex gloves and a facemask to reduce the risk of airborne exposure. When the plate/tray and utensils are picked up, the same precautions should be observed, and the dishes placed in a sink full of hot soapy water and cleaned immediately.
- If able, the quarantined person should wipe down all surfaces daily with an antimicrobial cleaning product and place the rags or paper towels used in a double sealed trash bag to be left outside the room for pick-up. All trash should be treated as a hazardous material and sprayed down with Lysol or other germ-killing spray before being placed in a bag for disposal or, if so equipped, taken directly to an incinerator.
- Any linens, dirty clothes, towels etc. should be placed in a double sealed trash bag by the isolated person and placed outside the room for pickup and laundering. The person handling this should wear a facemask and nitrile/latex gloves, place the items directly in the washing machine and wash with HOT WATER and laundry detergent.
- Should the quarantined person need to leave their stateroom for any reason, they will do so wearing a facemask to reduce the risk of exposure to others. If the person is to be taken off the vessel for medical care, the room should be completely cleaned with antimicrobial cleaners top to bottom. The persons performing the cleaning should wear nitrile/latex gloves and a facemask.
- Gloves should be turned inside one another to remove from hands and follow the other hazardous waste into the same bag.
- ANYONE entering the Quarantined persons room for any reason should wear a facemask and nitrile/latex gloves



- Cordless electrostatic sprayers are good if available to help with sanitization of all surfaces.
- In the event of a Presumptive Positive Case of COVID-19, refer to vessel reporting requirements for illness or death and the instructions for the CDC Maritime Conveyance Illness or Death Investigation Form.
- All shore leave should be prohibited.

Potential Reference Websites:

<https://www.cdc.gov/quarantine/pdf/maritime-conveyance-illness-or-death-investigation-form-3.pdf>

<https://www.internationalsos.com/medical-and-security-services/clinics>

<https://www.cisa.gov/publication/guidance-essential-critical-infrastructure-workforce>

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

<https://www.cdc.gov/coronavirus/2019-ncov/index.html>

<https://www.uscg.mil/Coronavirus>

<https://www.dhs.gov/coronavirus>

<https://dhs.gov/cybersecurity-and-critical-infrastructure>

<https://www.osha.gov/Publications/OSHA3990.pdf>

EMPLOYEE COVID-19 SCREENING QUESTIONNAIRE

The safety of all personnel is the overriding priority. In order to prevent the spread of the coronavirus and reduce the potential risk of exposure to our workforce, all personnel should complete and submit this questionnaire prior to entering the worksite. Please do not enter the worksite until your responses have been reviewed and your entry has been approved.

**Please respond to each of the following questions truthfully and to the best of your ability.**

Name:
Phone Number (mobile/home):





Position: \_\_\_\_\_

**Representations**

1	Are you currently experiencing, or have you experienced in the past 14 days, any of the following symptoms? ( <i>Please take your temperature before you answer this question.</i> )  Yes <input type="checkbox"/> No <input type="checkbox"/> Fever (100.4° F/37.8° C or greater as measured by an oral thermometer) Yes <input type="checkbox"/> No <input type="checkbox"/> Cough Yes <input type="checkbox"/> No <input type="checkbox"/> Shortness of breath or difficulty breathing Yes <input type="checkbox"/> No <input type="checkbox"/> Sore throat Yes <input type="checkbox"/> No <input type="checkbox"/> New loss of taste or smell Yes <input type="checkbox"/> No <input type="checkbox"/> Chills Yes <input type="checkbox"/> No <input type="checkbox"/> Head or muscle aches Yes <input type="checkbox"/> No <input type="checkbox"/> Nausea, diarrhea, vomiting
2	In the past 14 days, have you been in close proximity to anyone who was experiencing any of the above symptoms or has experienced any of the above symptoms since your contact?  Yes <input type="checkbox"/> No <input type="checkbox"/>
3	In the past 14 days, have you been in close proximity to anyone who has tested positive for COVID-19?  Yes <input type="checkbox"/> No <input type="checkbox"/>
4	Have you been tested for COVID-19 and are waiting to receive test results?  Yes <input type="checkbox"/> No <input type="checkbox"/>

5	Have you have tested positive for COVID-19, or are you presumptively positive for COVID-19 based on your health care provider's assessment or your symptoms?  Yes <input type="checkbox"/> No <input type="checkbox"/>  <b>NOTE: If you have tested positive for COVID-19 or have been presumptively positive for COVID-19 based on your health care provider's assessment or your symptoms, please contact your manager or human resources representative when: (1) you have had no fever for at least 72 hours (3 full days), without the use of fever-reducing medications; (2) your other symptoms have improved; and at least 7 days have elapsed since your symptoms first appeared.</b>
6	In the past 14 days, have you been on a commercial flight or traveled outside of the United States?  Yes <input type="checkbox"/> No <input type="checkbox"/>



7	<p>In the past 14 days, have you been in close proximity to anyone who has been on a commercial flight or traveled outside of the United States?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
8	<p>Is there any reason why you feel you are at higher risk of contracting COVID-19 or experiencing complications from COVID-19 by entering the facility? If "yes", please provide a brief explanation.</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Explanation: _____</p>

I hereby certify that the responses provided above are true and accurate to the best of my knowledge.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note: The information collected on this form will be used to determine only whether you may be infected with COVID-19. The information on this form will be maintained as confidential. Any questions should be directed to your manager or your human resources representative.

Access to worksite (circle one):          Approved          Denied

### 12.2 MadaCide FD Germicidal Solution

#### SAFETY DATA SHEET

Confirms to OSHA Hazard Communication Standard (CFR 29 1910.1200)

**SECTION 1 – IDENTIFICATION**

**Product Identifier**

**Product Name:**          **MADACIDE-FD Germicidal Solution**

**Product Code:**          **7020, 7021**

**Recommended Use of the Chemical and Restrictions**

**for Use Recommended Use:** Cleaner, Disinfectant, Deodorizer

**Restrictions for Use:** Use only as directed.





**Details of the Supplier**

**Manufactured for:** Mada Medical Products, Inc.  
625 Washington Ave  
Carlstadt, NJ 07042  
1-800-526-6370

**Emergency Phone Number**

**24-Hour Number:** 1-800-424-9300

**SECTION 2 – HAZARDS IDENTIFICATION**

**International:** 1-703-527-3887

**Classification**

<b>Hazard Class</b>	<b>Category</b>
Flammable liquid	3
Eye irritation	2A
Specific target organ toxicity (single exposure)	3

**Signal Word(s):** Warning

**Hazard Statement(s):** Flammable liquid and vapor. Causes serious eye irritation. May cause drowsiness or dizziness.

**Precautionary Statement(s):** Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing dust/fume/gas/mist/vapors/spray. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/eye protection/face protection. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. Store in a well-ventilated place. Keep cool. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Other Hazards**

**SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS**

1% of the mixture consists of ingredient(s) of unknown acute toxicity.

Chemical Name	CAS Number	Wt %
Isopropyl alcohol	67-63-0	10-30
2-Butoxyethanol	111-76-2	1-5

The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of

§1910.1200.

**SECTION 4 – FIRST AID MEASURES****First Aid Measures**

**Inhalation:** If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.

**Eye Contact:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. If irritation persists, get medical attention.

**Ingestion:** If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

**Skin:** In case of contact, immediately flush skin with plenty of water. Remove contaminate clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

**Most Important Symptoms and Effects (Acute and Delayed)**

**Inhalation:** Vapors may cause drowsiness and dizziness. May cause respiratory tract irritation.

**Eye Contact:** Causes serious eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

**Ingestion:** May be harmful if swallowed. May cause stomach distress, nausea or vomiting.

**Skin:** May cause skin irritation. Symptoms may include redness, drying, defatting and cracking of the skin.

**Indication of any Immediate Medical Attention and Special Treatment**

**Needed Note to Physician:** Treat symptomatically.



## SECTION 5 – FIRE FIGHTING MEASURES

### **Extinguishing Media**

**Suitable:** Water fog, carbon dioxide, dry chemical or alcohol foam.

**Unsuitable:** None known.

### **Specific Hazards Arising from Chemical**

Products of combustion include but are not limited to: oxides of carbon.

### **Protective Equipment and Precautions for Firefighters**

Keep upwind of fire. Wear full firefighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

## SECTION 6 – ACCIDENTAL RELEASE MEASURES

### **Personal Precautions, Protective Equipment, and Emergency Procedures**

**Personal Precautions:** Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition.

**Environmental Precautions:** See Section 12 for ecological information.

### **Methods and Material for Containment and Cleaning Up**

Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE). Scoop up material and

## SECTION 7 – HANDLING AND STORAGE

place in a disposal container. Provide ventilation.

### **Precautions for Safe Handling**

**Handling:** Keep away from sources of ignition. No smoking. Take precautionary measures against static discharge. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not swallow. Handle and open container with care. When using do not eat, drink or smoke. Use only non-sparking tools. Use only outdoors or in well-ventilated area.

**General Hygiene Advice:** Launder contaminated clothing before use. Wash hands before eating, drinking, or smoking.

### **Conditions for Safe Storage, Including any Incompatibilities**

**Storage Conditions:** Proper grounding procedures to avoid static electricity should be followed. Keep locked up and out of the reach of children. Keep container tightly closed and in a well-ventilated place. Keep cool.

**SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Incompatible Materials:** Oxidizers.

**Control Parameters****Exposure Guidelines:**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Isopropyl alcohol (67-63-0)	200 ppm	980 mg/m <sup>3</sup>	Not available
2-Butoxyethanol (111-76-2)	20 ppm	240 mg/m <sup>3</sup>	Not available

**Appropriate Engineering Controls**

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

**Individual Protection Measures**

**Respiratory Protection:** In case of insufficient ventilation, wear suitable respiratory equipment. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Skin and Body Protection:** Wear suitable protective clothing.

**Eye/Face Protection:** Wear approved eye protection (properly fitted dust- or splash-proof chemical safety goggles) and face protection (face shield).

**General Work/Hygienic Practices:** Handle in accordance with good industrial hygiene and safety practice. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking.

**SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES**

Handle according to established industrial hygiene and safety practices.

**Appearance:** Colorless liquid

**Odor:** Alcohol-like

**Odor threshold:** Not determined

**pH:** 7.6

**Melting point/freezing point:** Not determined

**Initial boiling point and boiling range:** Not determined

**Flash point:** 30°C (86°F) TCC

**Evaporation rate:** Not determined



**Flammability (solid, gas):**

Flammable

**Upper/lower flammability or explosive limits:** Not determined

**Vapor pressure:** Not

determined **Vapor density:**

Not determined **Relative**

**density:** 0.97

**Solubility(ies):** Not

determined

**Partition coefficient (n-octanol/water):** Not

determined **Auto-ignition temperature:** Not

determined **Decomposition temperature:** Not

determined **Viscosity:** Not determined

**SECTION 10 – STABILITY AND REACTIVITY**

**Reactivity:** Not reactive under normal conditions.

**Chemical stability:** Stable under recommended storage conditions. May form flammable/explosive vapor-air mixture.

**Possibility of hazardous reactions:** None under normal use.

**Conditions to avoid:** Heat. Incompatible materials. Sources of ignition. **Incompatible materials:** Oxidizers.

**SECTION 11 - TOXICOLOGICAL INFORMATION**

**Hazardous decomposition products:** May include and are not limited to: oxides of carbon.

**Information on Toxicological Effects**

**Likely Routes of Exposure:** Inhalation, skin contact, eye contact, ingestion

**Information Related to Physical, Chemical, and Toxicological Effects**

See section 4 of this SDS.

**Delayed and Immediate Effects as well as Chronic Effects from Short and Long-term**

**Exposure** Carcinogenicity: NTP: No IARC: No OSHA: No

**Numerical Measures of Toxicity**



Product	
ATE (oral)	>2000 mg/kg, rat
ATE (dermal)	>2000 mg/kg, rabbit
ATE (inhalation)	>20 mg/l/4h

**Component Information:**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Isopropyl alcohol (67-63-0)	4396 mg/kg (rat)	12800 mg/kg (rat)	72.6 mg/l/4h (rat)
2-Butoxyethanol (111-76-2)	470 mg/kg (rat)	Not available	450 ppm/4h (rat)

**SECTION 12 - ECOLOGICAL INFORMATION**

**Ecotoxicity:** Not established

**Persistence and degradability:** Not established  
**Bio accumulative potential:** Not established  
**Mobility in soil:** No additional information available

**SECTION 13 – DISPOSAL CONSIDERATIONS**

**Other adverse effects:** No additional information available.

See section 8 of this SDS for exposure controls and personal protection.

Dispose of the product and container in accordance with all applicable local, state, and federal regulations. The generation of waste should be avoided or minimized whenever possible. Handle empty containers with care because

**SECTION 14 – TRANSPORT INFORMATION**

residual vapors are flammable.

**Note:** Classification changes based on quantity, packaging, and method of shipment. See current shipping paper for most up to date shipping information.

UN1987, Alcohols, n.o.s. (Isopropanol), 3, PG III

**DOT (Ground):** Not regulated (49 CFR §

173.150(e)) **IATA (Air):** Regulated





## SECTION 15 – REGULATORY INFORMATION

**IMDG (Vessel):** Regulated (Greater than 5 liters otherwise limited quantity)

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

### CAUTION

Harmful if inhaled or absorbed through skin.  
Causes moderate eye irritation.

Avoid breathing vapors, and contact with eyes, skin, or clothing.

Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum or using tobacco. Remove contaminated clothing and wash clothing before reuse.

Do not use or store near heat or open flame.

All ingredients in this product are listed or are excluded from listing on the US Toxic Substances Act (TSCA) Chemical Substance Inventory.

### SARA 313

This product contains chemicals which are subject to the reporting requirements of the Superfund Amendments and Reauthorization Act and Title 40 of the Code of Federal Regulations, Part 372. Chemicals: Isopropanol and Butoxyethanol.

## SECTION 16 – OTHER INFORMATION

**Issue Date:** 05-Apr-2016

**Revision Date:** 05-Apr-2016

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designed and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



End of Safety Data Sheet

### 12.3 MadaCide INSTRUCTIONS FOR USE

#### What Is MadaCide FD? Who Uses It and How to Use It?

When you visit a hospital, the first thought that comes to mind is ‘germs!’ Hospital is a place where the sick are treated, and yet, a lot of people believe that visiting a hospital to support a sick friend, family, or acquaintance can infect them with the flu or some virus. Have you ever wondered how the doctors, nurses, and other staff working there don’t fall sick?

A lot of effort goes into making sure that the hospital environment is germ-free. People whose sickness or disease is contagious is either kept under quarantine or in a special ward, which is not accessible by everyone. The hospital ensures the safety of everyone who visits by taking the required action, such as keeping the premises clean using a disinfectant cleaner that is designed for infection control, such as MadaCide FD Germicidal Solution.

**BROAD SPECTRUM EFFECTIVENESS**

- ✓ Bactericidal
- ✓ Tuberculocidal
- ✓ Fungicidal
- ✓ Virucidal

**FEATURES / BENEFITS**

- ✓ Ready to Use
- ✓ Mild Scent
- ✓ Low Alcohol

**ORDERING INFORMATION**

No. 7020	32 oz. Spray Bottle	(12/case)
No. 7021	1 Gallon	(4/case)



What is MadaCide FD Germicidal Solution?

**MadaCide-FD Germicidal Solution** is a **disinfectant**, cleaner, as well as a deodorizer designed explicitly for the infection control needs of the healthcare industry. It is a hospital-level disinfectant formulated to disinfect hard, non- absorbent, inorganic, environmental surfaces. It is a one-step, air dry surface, broad range formula that is used where control of cross-contamination from cleaned and treated surfaces is of prime importance.

It is an ideal product that kills MRSA, VRE, TB, SARS, HIV, Hepatitis B and C, and Influenza A. An Efficacy test resulted in MadaCide FD being an effective germicide, bactericide, virucide, and fungicide. It helps in decreasing cross-contamination from treated surfaces such as respiratory therapy equipment, operating rooms, and medical instruments. It is made of a unique anti-corrosion formulation that prevents damage to plastics, rubber, lenses, cement, steel, brass, aluminum, or other metal when it is used as directed.

Who uses MadaCide FD Germicidal Solution?

**MadaCide FD Germicidal Solution** is a hospital-level disinfectant that is mostly used in the healthcare industry. It is ideal for use as a one-step cleaner, and it effectively sanitizes, deodorizes, and kills bacteria and germs on hard surfaces. It is used commercially as well as domestically.

It is used in critical care areas in hospitals and clinics as it is formulated to disinfectant inorganic, hard, non- absorbent, environmental surfaces such as chrome, painted surfaces, glass, plastics, and stainless steel usually found in hospitals.

MadaCide FD is also used in dental care for cleaning and disinfecting dental chairs, equipment, instruments, and surfaces, among others.

It is ideal for use in nursing homes and assisted living.

It is used as a germ and virus killer in the tattoo industries. Several tattoo studios all over the world are using MadaCide FD.

As it is an ideal choice for cleaning, disinfecting, sanitizing, and deodorizing, it is used domestically at home as well.

It can be used on plastics such as polycarbonate, polypropylene and polystyrene, polyvinylchloride, glazed porcelain, vinyl, stainless steel, painted surfaces, and glass.

MadaCide FD can also be used on ambulance equipment and surfaces, hospital counters and countertops, CPR training mannequins, respiratory therapy equipment, respirators or face pieces, laboratory equipment, among others.

Widely used as workstation prep items for infection control at tattoo parlors.



#### How to use MadaCide FD Germicidal Solution?

It is vital to note than **MadaCide FD Germicidal Solution** must be used as per the directions mentioned in the labeling. It is a violation of Federal law to use it in any other way, other than the directions of use mentioned.

For general cleaning, pre-cleaning, and deodorizing: Prior to disinfection, you must pre-clean all the surface using MadaCide FD Germicidal Solution and must make sure to remove all gross filth and heavy soil. For this purpose, apply the solution to the surface and allow it to sit for thirty seconds before wiping it with a clean towel or sponge.

For Ultrasonic cleaning: Remove all visible gross debris by thoroughly pre-rinsing the instruments under running water. Use just one ounce of MadaCide-FD Germicidal Solution per liter of water in the ultrasonic unit. Dip the instruments into the solution and activate the ultrasonic unit for five minutes or more, as needed. Remove the instruments and rinse, and follow with appropriate cleaning and disinfecting methods.

For hard, non-absorbent surface or articles: To Disinfect HIV-1, Herpes Simplex Virus Type 2, Influenza Strain A2/HK Virus, Pandemic 2009 H1N1 Influenza A Virus, Rotavirus Strain WA, MRSA, Hepatitis B and C virus, Canine Parvovirus, among several others, use MadaCide-FD Germicidal Solution as is. Do not dilute the solution. Thoroughly apply the solution to wet the precleaned surfaces and let it sit for six minutes. Wipe it with a clean towel and let it air dry.

For f Avian Influenza A disinfection, the product must be used only for surfaces that are not favorable to treatment by immersion or excess liquid.

For surface objects soiled with blood or body fluids, for cleaning and decontamination against HBV, HCV and HIV-1: Make sure to wear a latex glove face mask and/or eye covering, protective gown, when handling HBV, HCV and HIV-1 infected blood or body fluids. Clean all surfaces thoroughly before the application of MadaCide-FD Germicidal Solution.

The used solution must be disposed of as per the local regulations for infectious waste disposal.

## UC San Diego Guidelines for Evaluation of Divers during COVID-19 pandemic

Charlotte Sadler, MD, Miguel Alvarez Villela, MD, Karen Van Hoesen, MD, Ian Grover, MD, Tom Neuman, MD, and Peter Lindholm, MD, PhD

### Background:

Coronavirus Disease 2019 (COVID-19) has become a global pandemic with SARS-CoV2 infecting millions of people and resulting in thousands of hospitalizations and deaths worldwide. Research examining the origins and structure of the virus, its pathogenesis, and the clinical features of its acute presentation is growing at a fast pace. However, as a nascent pandemic, the



long-term sequelae to be expected in those who have survived the acute disease are largely unknown. SARS-CoV2 infection manifests primarily as atypical pneumonia, but in severe disease other complications are common, including cardiac and thromboembolic disease.

Scuba diving is a passion for many recreational divers, but, more importantly, it also represents a critical component of the commercial diving industry and scientific research. UCSD runs a diving medicine clinic that sees approximately 250 divers per year, most of whom are employed as commercial and scientific divers. As society begins to re-open after quarantines, many of these divers are presenting to our (and others') clinic requesting guidance and clearance on returning to dive after the pandemic.

### **COVID-19 and Diving:**

We are presented with the challenge of performing fitness to dive evaluations in the context of a disease in which the natural history is currently unknown. In what we know of the pathophysiology of the disease, the pulmonary, cardiac, and thromboembolic/hypercoagulable disease seems to be relevant to divers. Potential long-term sequelae include decreased exercise tolerance, increased susceptibility to cardiac events such as heart failure, pulmonary edema, and arrhythmia, structural changes of the lung leading to increased risk for barotrauma, and increased risk of decompression sickness from underlying hypercoagulability.

Unfortunately, we do not have the luxury of waiting 6-12 months to evaluate our divers when there will likely be much better information to provide evidence-based guidelines. Thus, we have developed working guidelines based on the limited evidence of sequelae of COVID-19 available and our experiences with other diseases that share similar features, such as pneumonia and cardiomyopathy. We fully anticipate we will be able to revise these guidelines as more evidence becomes available. They are not meant to be prescriptive, but to share our experience with other institutions and organizations who are faced with similar challenges.

Our goal has been to categorize divers based on the history and severity of their illness and base their return to dive evaluation accordingly. As with any illness, ultimately the work up is left to the discretion of the evaluating physician. Our plan is to update them frequently as we gain more experience and more evidence becomes available. The following guidelines are referring to divers who are completely asymptomatic after their illness, including exercise tolerance (see below). Before using the guidelines below, a few terms warrant definition:

May 8, 2020

### *Definitions of terms used in guidelines:*

#### **COVID-19-suspected Illness**

We define a COVID-19-suspected illness as a diver who had symptoms consistent with COVID-19 with or without a positive PCR or antibody test, given that testing is currently unreliable and many were not tested. As more accurate antibody testing is



developed and becomes widely available it will likely be useful in guiding these evaluations. We are currently using the CDC case definition (updated April 5, 2020) of COVID-19 for those patients who did not have PCR or antibody confirmed illness:

At least two of the following symptoms: fever (measured or subjective), chills, rigors, myalgia, headache, sore throat, new olfactory and taste disorder(s)

OR

at least one of the following symptoms: cough, shortness of breath, or difficulty breathing

OR

Severe respiratory illness with at least one of the following: Clinical or radiographic evidence of pneumonia, or acute respiratory distress syndrome (ARDS)

AND

No alternative more likely diagnosis

### **Exercise Tolerance**

This is likely the most important definition used in our guidelines and it is vital that physicians evaluate it carefully. It is our belief that a diver with significant cardiac or pulmonary pathophysiology would not have a normal exercise tolerance. However, the definition of the word normal is critical. First, the diver must have returned to his or her baseline level of exercise and tolerance. Even minor deviations from their baseline (“getting more winded,” longer recovery times, etc.) warrants further testing and investigation. Second, the physician must be satisfied that the diver’s exercise regimen warrants an appropriate exertional test for diving.

There are no universally agreed upon recommendations on an exercise tolerance level needed for all divers, but the ADCI guidelines for commercial divers require a minimum level of 10 METS. If the physician is not convinced that the diver’s self-reported exercise level meets appropriate criteria or concerned that it would not reveal underlying cardiac or pulmonary disease, further testing is warranted.

### **GUIDELINES FOR DIVER EVALUATION**

#### ***Category 0 Asymptomatic Diver without history of COVID-19 suspected illness***

We recommend divers who have no history of COVID-19 suspected illness 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.

#### Commercial Divers



- Initial/annual exam per ADCI guidelines
- Chest radiograph only if required per Q 3-year cycle
- No additional testing required

#### Scientific Divers AAUS/NOAA

- Initial/recurrent exam per AAUS or NOAA guidelines
- No additional testing required

#### Recreational

- Follow RSTC guidelines
- No additional testing required

#### ***Category 1 Asymptomatic Diver who had a mild COVID-19-suspected illness***

We define a mild illness as any patient who:

- 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
- They have returned to their baseline exercise tolerance.

#### Commercial Divers/Scientific Divers/Recreational

- Initial/annual exam per ADCI/AAUS/NOAA/RSTC guidelines
- Spirometry
- Chest radiograph (PA & Lateral)
- If chest radiograph is abnormal, obtain Chest CT scan
- If unknown (or unsatisfactory) exercise tolerance, perform exercise tolerance test with oxygen saturation

#### ***Category 2 Asymptomatic Diver who had a moderate COVID-19-suspected illness***

- We define a moderate illness as any patient who:
- required supplemental oxygen or was hypoxic
- had abnormal chest imaging (chest radiograph or CT scan)
- admitted to the hospital but did NOT require assisted ventilation (BIPAP, CPAP, or ventilator) 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
- They have returned to their baseline exercise tolerance.

#### Commercial Divers/Scientific Divers/Recreational



- Initial/annual exam per ADCI/AAUS/NOAA/RSTC guidelines
- Spirometry
- Chest radiograph (PA & Lateral) (if abnormal, obtain Chest CT)
- ECG
- Echocardiogram (if no work up was done 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 ADCI/AAUS/NOAA/RSTC guidelines

***Category 3 Asymptomatic Diver who had a severe COVID-19-suspected illness***

- We define a severe illness as any patient who:
- Required mechanical or assisted (CPAP, BIPAP) ventilation, or ICU admission
- Cardiac involvement defined as abnormal ECG, abnormal 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 another coagulopathy)
- They have returned to their baseline exercise tolerance.

**Commercial Divers/Scientific Divers/Recreational**

- Initial/annual exam per ADCI/AAUS/NOAA/RSTC 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 ADCI/AAUS/NOAA/RSTC guidelines

***Symptomatic divers or those with abnormal test results***

It is not currently our plan to allow divers who are symptomatic or have abnormal testing per the guidelines above to dive (though each will need to be evaluated on a case by case basis and exceptions are to be expected). However, we do not feel this necessarily represents a lifetime ban on diving as many of the sequelae which are currently disqualifying (such as abnormal CT scans) may resolve over the next 3-6 months and re-testing may be indicated. It is currently unknown whether or not potential sequelae of COVID-19 will become chronic and therefore re-evaluation will likely be indicated until more evidence becomes available.

***Screening of diving employees prior to diving***

We currently recommend following CDC guidelines for screening of an employee prior to diving and do not feel that measuring vital signs or oxygen saturation routinely before diving are warranted. Any diver should not dive if they currently





have a fever, or have had any of the following symptoms in the last 14 days (cough, shortness of breath or difficulty breathing, fever, chills, muscle pain, or new loss of smell or taste).