



SID  
Surf Injury Data

# HEALTH GUIDE, SUGGESTIONS AND GUIDELINES FOR RETURNING TO SURFING

EDIÇÃO COVID-19

This guide is intended to guide surfers (practitioners and professionals), health professionals, associations, surfing clubs and schools, and anyone who may be interested. The Health Guide, Suggestions and Guidelines for Return to Surf aims to inform about the impact of COVID-19 on the health of surfers and make suggestions for medical conduct on returning to surfing after the quarantine period, in accordance with the scientific evidence known until June 2020 and with the standards established by local authorities.

## Authors

Dr. Pedro Luiz R. Guimarães Filho  
Dr. Marcelo Baboghluian  
Dr. Guilherme Vieira Lima

## Collaborators

Dr. Roberto Nahon  
Dr. João Felipe Franca  
Dra. Claudia Lucia Castro

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Surf Injury Data (SID) - Brasil  
[www.surfinjurydata.org](http://www.surfinjurydata.org)

SP office: Rua Major Natanael, 103  
Pacaembú, São Paulo - SP - CEP: 01246-100

RJ office: Av. Afonso Arinos de Melo Franco, 222  
Barra da Tijuca, Rio de Janeiro - RJ - CEP: 22631-455

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# INTRODUCTION

COVID-19 disease was first identified in Wuhan, Hubei province, People's Republic of China, on December 1, 2019, with the first case being reported on December 31, 2019. On January 30, 2020, the World Health Organization (WHO) declared COVID-19 an International Public Health Emergency. Subsequently, due to the alarming levels of spread and severity of the infection, the WHO assessed that COVID-19 can be characterized as a Pandemic.

Since then, several measures have been taken by governments seeking to contain the spread of the virus and reduce the number of cases. Among these measures, we can consider that quarantine and social isolation were the ones that most influenced the practice of surfing worldwide.

Some cities and countries started to show a reduction in the number of cases, beginning their processes of decreasing social isolation, which made it possible for most surfers to return to surfing.

However, after a long period of quarantine and social isolation, some individuals had a reduction in the levels of physical activity and/or worsened the quality of their food, in addition to a considerable number of surfers having been infected by COVID-19. Therefore, it is necessary that surfers and the health professionals responsible for them guarantee a return to surfing with the greatest possible safety, seeking to minimize the risks of undesirable situations related to the practice of the sport.

# 1. IMPACT OF COVID-19 ON PHYSICAL ACTIVITY AND SURFING

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On March 11, 2020, COVID-19 was characterized by WHO as a pandemic. According to data from the WHO itself, 7,410,510 cases of COVID-19 (136,572 new in relation to the previous day) and 418,294 deaths (4,925 new in relation to the previous day) were confirmed by June 12, 2020 worldwide. scientific community does its best to better understand the symptoms, progression and severity of the infection and seeks to develop an effective treatment and vaccine, several measures have been imposed by governments seeking to reduce the spread and impact of COVID-19 on its population and health systems. Of all the proposed and imposed measures, none influenced physical activity and surfing more than quarantine and social isolation.

This measure had a direct impact on the general health of the population, both due to the restriction to the practice of physical activity and sports, as well as the influence on their eating pattern. Exercise restrictions have resulted from the shutdown of beaches, gyms and sports centers; the prohibition of surfing; the lack of space and infrastructure in the homes for physical exercise and the lack of technical knowledge of the population about adequate training routines.

Its effects on food include limited access to stores, an eventual worsening in the quality of food products consumed due to the already visible impacts on family income, a possible excess of food, among others. Before this pandemic, physical inactivity was already described as a global public health problem, with more than a quarter of all adults not performing the levels of physical activity necessary for good health.

The reduction in the practice of physical activity in healthy adults for a period of more than three days can lead to impaired glycemic control, increased fat mass, reduced lean mass and decrease aerobic capacity. In adults with overweight/obesity, in addition to the changes mentioned, this reduction in physical activity can still negatively influence the control of the lipid profile. Regarding body composition, there is a tendency to increase fat mass and reduce lean mass.

In the elderly, the reduction of physical activity levels is directly related to the reduction of muscle mass. In this population, muscle mass plays an extremely important role in quality of life and survival. For this reason and due to the role of physical activity in the mental health of the elderly, the decrease in physical activity can have worse consequences in the elderly, accelerating the aging process and the appearance of age-related diseases, in addition to influencing their quality of life.

The change in dietary pattern occurred in a considerable portion of the population. In some cases, there was an increase in caloric intake with a worsening in the quality of the food eaten. For individuals who performed this increase in caloric intake and/or reduction in the practice of physical activity, we can consider that there was an instability in the energy balance (caloric intake greater than the expenditure), which can have the immediate effect of increasing weight at the expense of fat and reduction in muscle mass and performance, and as a late effect, altering or increasing the risk of cardiovascular conditions, as illustrated in Figure 1.

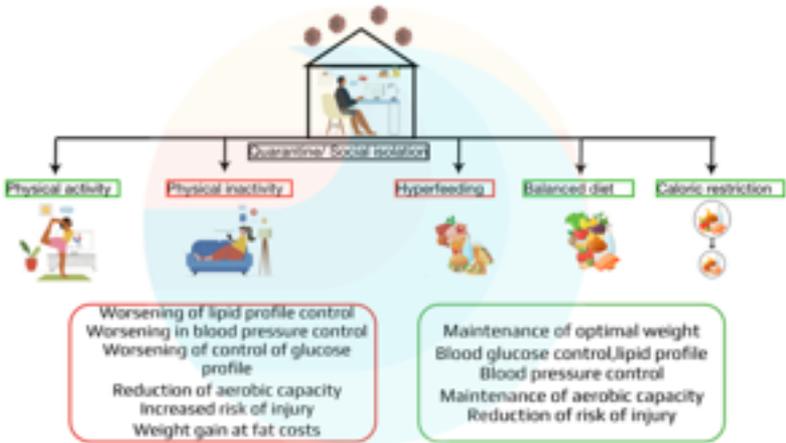
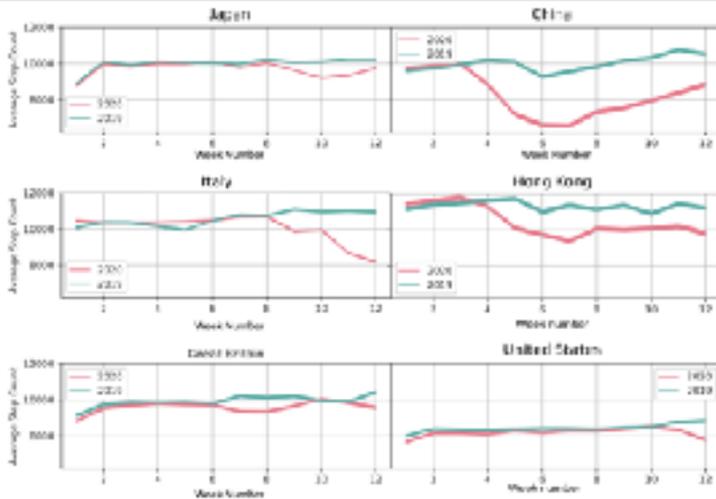


Figure 1 - Possible effects of quarantine and social isolation on the health of surfers of different ages and levels.

All the considerations made so far are more directed to the general population. For professional surfers (athletes who practice surfing as a competitive modality), changes in physical activity levels - whether in physical training or surfing - can lead to considerable losses in the process of returning to competitions, including reduced performance, strength, flexibility and increased risk of injury.

Although the real impact of social isolation and quarantine on physical activity levels is not yet measurable, we can take as an example the data provided by Fitbit Inc. (a North American accessory company that tracks an individual's physical activity level). She who recently shared physical activity data for 30 million users that shows a substantial reduction (ranging from 7% to 38%) in average step count in almost all countries during the week ending March 22, 2020, in compared to the same period of the previous year (Graph 1). For this chart, it is interesting to note that each of these countries were at a different stages of the COVID-19 Pandemic..



Graph 1- Graphs displayed by Fitbit Inc. illustrating the reduction in steps taken in several countries during the COVID-19 period compared to the same period in the previous year.

## 2.

# CARDIOVASCULAR CONSIDERATIONS

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The cardiovascular system is one of the main systems that can be compromised by the SARS-Cov-2 virus, with cardiac impairment standing out. Among the possible causes for this impairment, we can mention the action of the SARS-Cov-2 virus on ACE2 receptors, present both in the upper airways and in the myocardium, which can lead to lesions in the myocardium and/or in the pericardium. The SARS-Cov-2 virus can lead to several cardiac changes (Figure 2). Since COVID-19 generates an inflammatory and prothrombotic state, cases of acute coronary syndrome have also been associated with SARS-Cov-2 infection.

Individuals with more severe COVID-19 require hospitalization, especially in intensive care beds (ICU). Considering data from a Chinese study, acute cardiac injuries can occur in up to 30% of hospitalized individuals infected with the SARS-Cov-2 virus, much higher than 1% of cardiac impairment in individuals with other viral infections.

For practicing surfers, even more attention should be paid to possible cardiac impairments. Practicing surfers tend to be of all ages and, therefore, include a considerable number of individuals over 35 years old and/or with some comorbidity and/or risk factor for cardiovascular diseases. In addition, the group of practicing surfers is usually the group that does not have specific medical monitoring for physical activity, often never having carried out a pre-participation medical evaluation compatible with their age group or clinical condition.

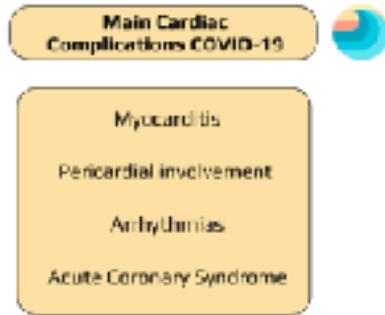


Figure 2–

Main cardiac

complications COVID-19

Individuals who have used or are using the medication Chloroquine or Hydroxychloroquine as a treatment/prevention proposal for COVID-19 should report this to their attending physicians and must undergo a cardiological evaluation before returning to surfing.

When considering the practice of physical activity in general, we must highlight myocarditis among the cardiovascular complications of COVID-19. Myocarditis is one of the main causes of sudden death in individuals under 35-40 years of age. Myocarditis can present very broad and heterogeneous symptoms (Figure 3), which may include non-specific symptoms such as: fatigue, malaise, reduced performance, muscle pain, increased resting heart rate, nausea and vomiting, among others; or more specific symptoms such as: chest pain, palpitation, dyspnea (shortness of breath) and exercise intolerance. Physical exercise can be a triggering factor for myocarditis and, in the acute phase of myocarditis caused by COVID-19, exercise can increase viral replication, increase inflammation and cell necrosis and, therefore, can generate an arrhythmogenic myocardial substrate. Myocarditis can leave tissue scars that

can lead to dilated cardiomyopathy or generate arrhythmias, when it is not a cause of sudden death.

As of the time of publication of this document, there is insufficient data to describe a typical clinical presentation of myocarditis associated with mild COVID-19 or data that can predict the outcome of long-term cardiac impairment..

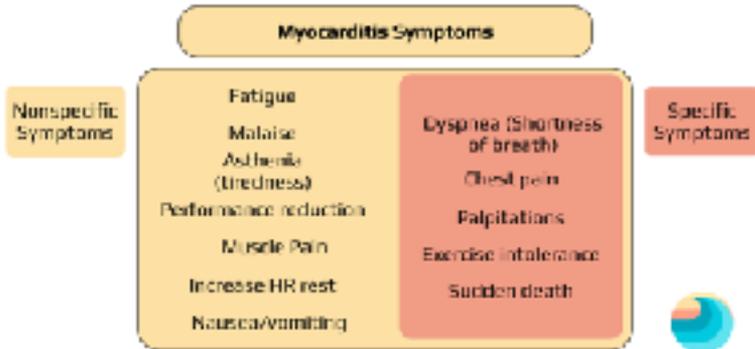


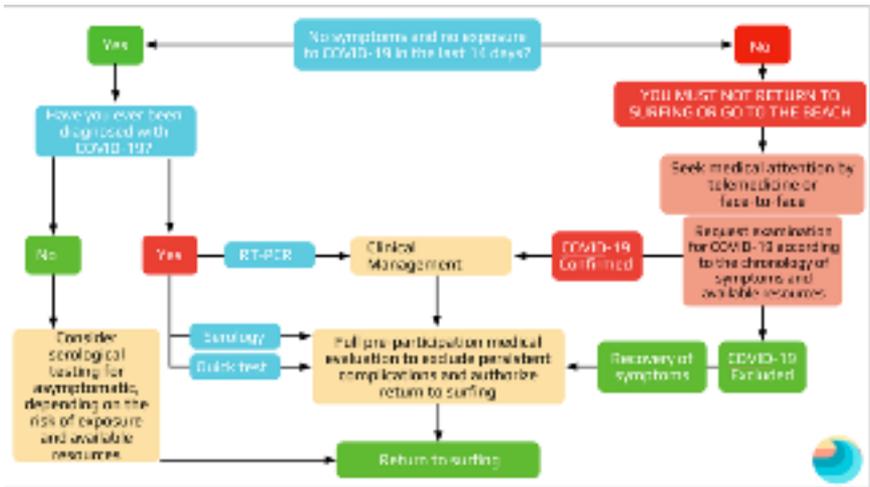
Figure 3 - Myocarditis main symptoms. HR = Heart Rate

For professional surfers, many of these nonspecific symptoms can be confused or misinterpreted with conditions directly related to training (e.g. exhaustion related to training/overtraining, depression or psychosomatic changes).

In addition, professional surfers tend to be a group of individuals with characteristics that do not fit the risk group for COVID-19 (young people and without comorbidity). For this reason, it is expected that it is assumed that if a professional surfer is contaminated, he does not present any symptoms (asymptomatic) or has mild symptoms, inducing the failure to perform tests to confirm the infection. However, even if this does occur, it is not possible to exclude the risk of myocardial

involvement in any group of individuals infected by the SARS-Cov-2 virus, including asymptomatic individuals. Therefore, we remember that the delay and/or the failure to carry out tests that confirm the COVID-19 infection may cause the diagnosis or therapeutic measures to be delayed or not performed, which may cause incalculable damage to the athlete's health.

Thereby, it is prudent to recommend that individuals who have had contact with the SARS-Cov-2 virus should undergo a medical evaluation for risk stratification before returning to surfing. Reinforcing that this recommendation is both for individuals who have been hospitalized, and for those who have had mild to moderate symptoms. There is still a debate in the scientific community about what would be the ideal approach for individuals without typical symptoms of COVID19 or without clear contact with the virus who wish to return to the practice of physical activity. The basic initial management suggestion for returning to post-quarantine surfing by COVID-19 is illustrated in Flowchart1.



Flowchart 1 - Initial management for returning to post-quarantine surfing by COVID-19.

We would like to highlight that individuals with comorbidities (Figure 4) are considered to be at risk for COVID-19 and, therefore, have a higher risk of unfavorable outcomes due to COVID-19 infection. This group must have a careful and detailed cardiovascular medical evaluation, including any medication adjustments already in regular use or complementary exams specific to the patient's basic condition. For this group of surfers, it may be necessary to perform some degree of cardiac rehabilitation before returning to sport at full levels.

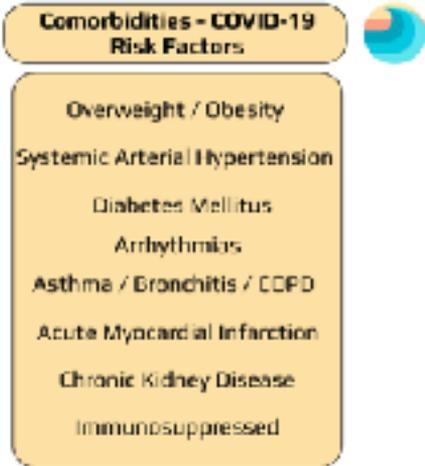


Figure 4 - Comorbidities considered risk factors for complications of COVID-19.

# 3.

## MUSCULOSKELETAL CONSIDERATIONS

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Musculoskeletal symptoms (affects bones, muscles and/or joints) such as fatigue, myalgia (body pain) and arthralgia (joint pain) are described as common symptoms of COVID-19, and are usually present in the early stage of the disease, however, there are reports of this symptoms remaining until the final stage.

The prevalence of fatigue varies from 25.6% to 50% of cases, whereas arthralgia and myalgia vary from 15.5% and some studies report incidences greater than 50%. The wide variation in incidence is due to the broad spectrum of virus manifestation. In addition, a different pattern of musculoskeletal impairment is also observed between different population groups. Chinese studies show lower rates than those carried out in Europe, but there is still no justification for this difference.

If there is a considerable deterioration in an individual's quality of life because of these symptoms, it is recommended that he seek medical attention. This is necessary since, in these cases, the clinical characteristics of these symptoms must be analyzed considering the new evidence in COVID-19. Musculoskeletal symptoms should be analyzed together with laboratory findings, such as inflammatory and infection-related parameters (interleukin-6, procalcitonin, C-reactive protein).

The involvement of the musculoskeletal system has not been thoroughly investigated during this pandemic. To date,

there are no published studies or scientific articles on the presence of COVID-19 in muscles, joints or bones. These symptoms are attributed only anecdotally as indirect effects, mainly resulting from the inflammatory and/or immune response to infection. Despite this, there are lines of study that argue that other mechanisms may be associated, such as direct damage by the virus to the endothelium or peripheral nerves. We believe that clarification of the real mechanism involved with these symptoms can help to plan specific rehabilitation protocols in patients with COVID-19.

Regardless of the level of skill of the surfer, it is important to understand that quarantine and social isolation can represent a period of significant decrease in the volume and intensity of training, with drastic changes in sports routine and life. Therefore, the orthopedic impact on the return of surfers to their normal activities should also be taken into account. Over-training - defined as prolonged or excessive repetitive activity/exercise - as an option to "catch up" does not allow the body to adjust and recover, which can lead to decreased performance and/or increased risk of injuries.

# 4.

## SURF TRIPS GUIDELINES

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The search for the perfect wave in the most diverse continents and exotic locations on the globe is part of the culture of surfing. Taking trips to surf goes beyond leisure for professional surfers who compete in the various stages of their respective world circuits. For this reason, the SID seeks to make some recommendations to ensure safety on trips taken at this time of the COVID-19 Pandemic.

### **Individual recommendations**

- The Pandemic is still going on. Therefore, control measures may vary between each city, state or country, according to the stage of the Pandemic at the destination. Find out about the laws and regulations of your destination, one of which may be the mandatory quarantine for travelers.
- Wear a mask whenever you are in environments with other people, such as public transport, on the street, at the hotel, etc.
- Since the clinical respiratory symptoms of COVID-19 are similar to those of the flu, it is essential not to underestimate any symptoms. Also, make sure you are up to date with your flu and yellow fever vaccine to rule out this differential diagnosis.
- Avoid consuming raw or undercooked animal products. Raw meat, milk or animal organs must be treated with care

to avoid cross-contamination with raw food, in accordance with good food safety practices.

- Avoid large concentrations of people in public spaces (public transport, cinemas, shopping centers, educational establishments, restaurants, etc.).
- If these activities are unavoidable, avoid touching objects such as handrails and door handles and bringing your hands to your nose or mouth.
- Avoid close contact with those who have a fever and cough. Keep the social distance of at least 1.5m.
- When coughing and sneezing, cover your mouth and nose with flexed elbow or tissue - discard tissue immediately and wash your hands.
  - Wash your hands frequently with soap and water for at least 20 seconds. Use an alcohol-based hand sanitizer if there is no soap and water.
  - 
  - If you are experiencing any of the symptoms related to COVID-19 or have come into close contact with a suspected or positive case of COVID-19 in the last 14 days, maintain social isolation and do not travel. Seek medical attention for proper guidance.
  - 
  - If you have had any symptoms related to COVID-19 less than 14 days ago, seek medical evaluation for guidance on your health condition for the trip.

### **Recommendations for Inside the plane**

- The general public should pay attention to good standard hygiene practices. Such practices include wearing a mask,

covering your mouth and nose when coughing or sneezing, washing your hands carefully and regularly with soap and water or with 70% gel alcohol. International Civil Aviation Organization (ICAO) standards state that the aircraft must be equipped with a universal precaution kit for the use of cabin crew members in the management of incidents of health problems associated with a suspected case of contagious disease and that the crew is properly trained in the use of these kits. Thus, the cabin crew has the necessary tools and training to ensure infection prevention during the voyage.

- The crew is highly trained and has knowledge on how to deal with all suspected cases of infectious disease on board a flight, including suspected cases of COVID-19. If a traveler is suspected of having an infectious disease, the crew will normally ensure that all necessary passengers complete a 'Passenger Location Form'. Passengers provide their contact details, which allows for subsequent follow-up, if necessary. The standards state that kits containing all the equipment necessary to protect all travelers are available on all planes.
- According to the ICAO, the current probability of contracting the virus during flights is extremely low, given that:
  - aircraft cabins have highly effective HEPA (particulate air) filter systems that remove airborne virus particles;
  - aircrafts are disinfected between flights, if necessary, in accordance with ICAO standards;
  - and procedures were implemented to mitigate the spread of disease during air travel.

# 5. SURF SESSION RECOMMENDATIONS

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## 1. Respect local laws

The COVID-19 pandemic is a reality in many countries, but its epidemiological phase differs greatly between cities, states and countries. For this reason, we find places where surfing is allowed, while in others it is temporarily prohibited. Pay attention to the laws, prohibitions and authorizations in force in your city.

## 2. Presence of symptoms

Infection with the SARS-Cov-2 virus can lead to several clinical symptoms at different intensities. Considering that both individuals with symptoms and asymptomatic individuals can transmit the virus, if you have any symptoms that may be related to COVID-19 or have been in contact with any confirmed case: stay at home!

If you have ever had symptoms that may be related to COVID-19, or if you have a test (RT-PCR or serology) that confirms that you have already been infected, seek medical advice for release to return to surfing!

## 3. Stay Local

Avoid going surfing on beaches other than the one closest to your home or the one you frequent regularly.

## 4. New Social Etiquette

Since COVID-19, we live in a time of new social etiquette. By respecting it you will be protecting yourself, your colleagues, family members and your entire community.

### a) When out of the water:

- Always wash your hands with water and soap or 70% gel alcohol;
- Wear a mask and/or individual face shields.

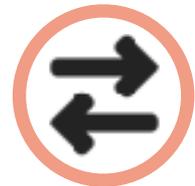


### b) In and out of water:

- Compliment your colleagues with "Aloha" or with your elbows, avoid shaking hands;
- Keep the social distance (at least 1.5 m away);
- Protect your face if you are going to cough or sneeze.

## 5. Arrive - surf - Exit

- Arrive dressed and ready to surf;
- Depending on the distance from the beach, warm up before reaching the beach;
- Avoid bathing/showering in public places after the session;
- During the session, keep your social distance (at least 1.5 m away);



## 6. Duration of the session

- Intense physical activity, with long duration and/or without an ideal recovery period can weaken the immune system and facilitate COVID-19 infection.
- Perform a warm-up session before entering the water;
- Do shorter sessions (avoid spending more than 1-2 hours in the water);
- Hydrate yourself well before and after the session;
- Have a good diet and rest between sessions.

## 7. Transport

- If you use public transport, respect the New Etiquette and wash your hands as soon as possible with water and soap or 70% gel alcohol;
- Avoid giving rides or hitchhiking to go surfing;
- Try to come back from the session the same way you did.

# 6. RECOMMENDATIONS FOR SCHOOLS, TRAINING CENTERS AND ANY SURFING RELATED

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1- Reorganize the flow of teachers, employees and students in order to have a social distance, avoiding proximity in moments such as information request, registration, change of clothes, in class or training.

2- Restrict the number of students per class looking for low proximity and agglomeration outside and inside the water.

3- Increase the interval between classes in order to avoid meeting of students.

4- Discourage staying on the beach after class.

5- Teachers, staff and students must wear a mask when on premises or on the beach, except when entering the sea.

6- Objects in common use, such as boards, ropes, rubber clothing, should be washed with soap and water, and sprayed with alcohol after each class.

7- Do not allow the sharing of personal objects such as towels, bottles, glasses, cutlery.

8- Teachers, staff and students who show flu symptoms should be advised not to attend and to be in isolation, assessing the need for medical care.

9- Pool Surf Schools must follow the guidelines for gyms and swimming pools in your city, in addition to those described above.

# 7. MEDICAL EVALUATION - SID SUGGESTION TO HEALTH PROFESSIONALS

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## 7.1 COVID-19 considerations

The medical assessment for professional surfers and athletes must follow the basic recommendations and with the most scientific evidence available. The purpose of this section of the document is to serve only as a general guide or guidance for the doctor or health professional who will carry out the evaluation of the surfer in question on an outpatient basis.

According to the WHO recommendation, it is suggested that as many patients as possible perform a laboratory test to investigate current or past infection with the SARS-Cov-2 virus. We remind that every patient should seek medical advice to carry out additional tests. The choice of the test to be requested (RT-PCR, serological or “rapid test”) should be based on the presence or absence of symptoms, the chronology of the onset of symptoms or considerable exposure to COVID-19, as shown in Figure 5.

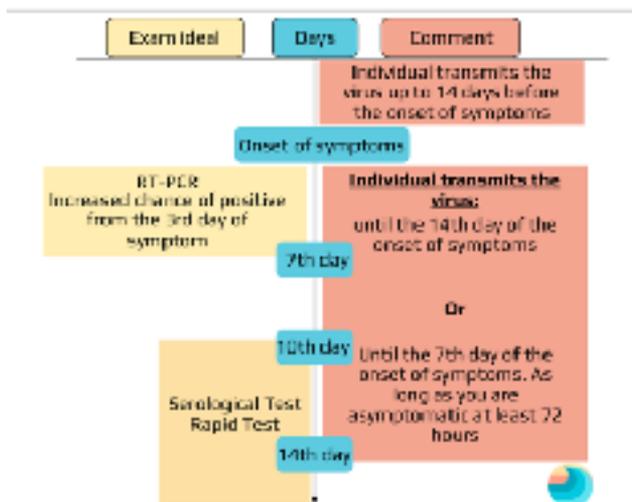


Figura 5 – Cronologia dos sintomas x teste ideal x transmissão do vírus da COVID-19.

COVID-19 can have a broad and nonspecific clinical presentation, although it typically represents a viral infection of the upper airways. Therefore, it is important to know which symptoms were related to covid-19 and to recognize which are more typical and which indicate severity (Figure 6). The extent of the systemic involvement of COVID-19 is not yet well established, despite the evidence of impairment from different systems. Table 1 illustrates some examples of the various systems that demonstrate acute/late impairment after COVID-19 infection and its potential impacts on individuals who wish to return to sports/surfing. Thereby, the laboratory evaluation of a COVID-19 patient should be based on this possible systemic involvement (Figure 7).

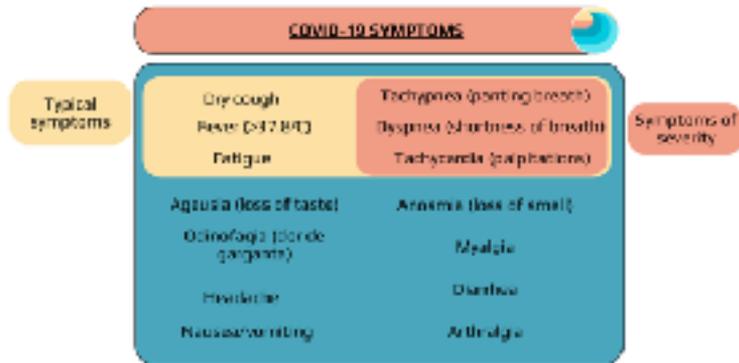


Figure 6 - Main symptoms related to COVID-19, with emphasis on typical symptoms and symptoms that indicate severity.

System	Acute Complications Associated with COVID-19	Possible implications for individuals returning to the sport
Respiratory	Pneumonia/viral SRAC	Reduced aerobic capacity and increased respiratory distress Possible restrictive lung patterns and reduced diffusion capacity
Cardiovascular	Myocarditis Pericardial involvement Arrhythmias Synd. Acute Coronary DVT / DVTPE	Return to exercise with cardiac complications present may represent contraindication for some individuals Reduction of aerobic capacity Persistence of inflammatory state
Kidney	Acute Kidney Injury	Persistent subclinical kidney injury may be a risk to return to high-intensity training
Gastrointestinal / Hepatic	Abnormal liver function; Some cases of COVID-19 may have gastrointestinal symptoms	Consider COVID-19 in patients with associated respiratory and gastrointestinal symptoms Increased risk of hepatotoxic medications
Mental Health	Symptoms of depression and anxiety More common in patients with lower social support	Increased risk of post-traumatic stress disorder, depression and anxiety Persistent depression and anxiety have been reported after other epidemics in non-athletic populations

Table 1 - Systems that can be affected by COVID-19 in an acute and/or late way and its consequences for the return to surfing. DVT = Deep Venous Thrombosis / DIC = Disseminated Intravascular Coagulation.

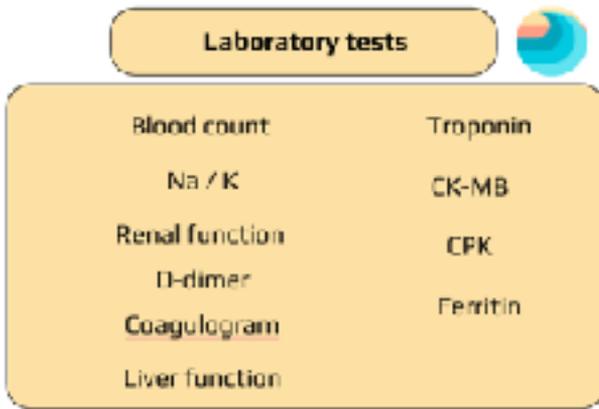
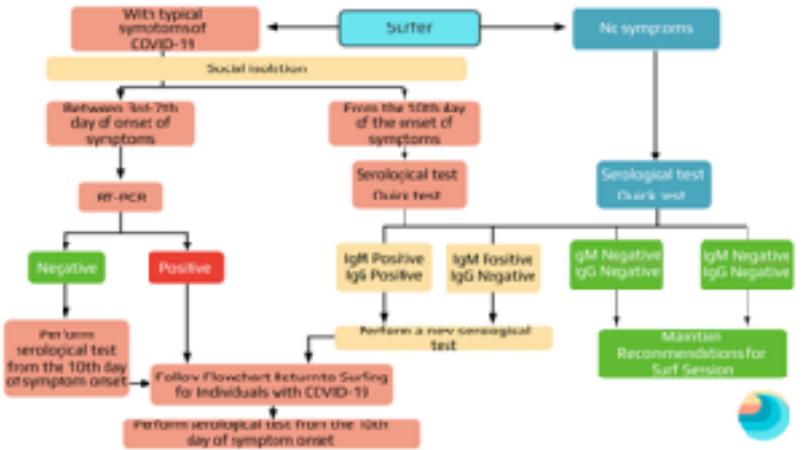


Figura 7 – Proposed laboratory tests for clinical follow-up of suspected or confirmed patients with COVID-19

As reinforced by Flowchart 2, patients with respiratory symptoms should not go to the beach or surf, and should maintain social isolation not only because of the risk of worsening symptoms but also of transmitting the virus to the community. These symptomatic patients should seek medical attention to assess the need and availability to perform an examination for COVID-19 according to the chronology of symptoms and available resources (as shown in Figure 5). In addition, Flowchart 2 includes the suggestion on which ideal test to order according to the chronology of symptoms, and the practical interpretation of its result is complemented by Table 2.

It is extremely important to establish the chronology of the onset of symptoms, age group and the presence of any patient comorbidity. The greatest risk of unfavorable evolution and worsening of symptoms occurs between the 7th and 10th day of symptom onset, requiring more careful monitoring by the responsible physician during this period. Graph 3 illustrates different examples of how the intensity of symptoms may vary according to the chronology of the onset of symptoms, both for cases that progress with complications/hospitalization, and for cases without complications.



Flowchart 2 - Recommendation of tests and medical evaluation for return to post-quarantine surfing by COVID-19.

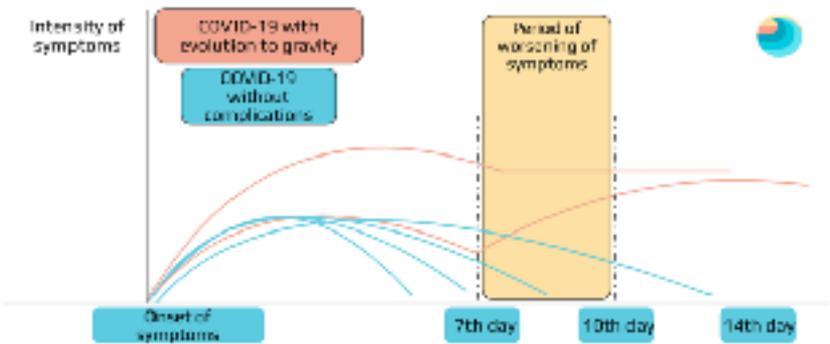
RT-PCR	IgM	IgG	Interpretation	Recommendation
-	-	-	Patient may be in the window of the infection period	Consider COVID19-
-	+	-	Patient may be in the early stages of infection	Consider COVID19+
-	+	+	Patient is in the active phase of infection	Consider COVID19+
-	-	+	Patient may be in late or recurrent stage of infection	Consider COVID19+
NR / -	+	-	Patient may be in the early stage of infection and PCR is false-negative; Antibody testing may be false-positive	Perform a new antibody test. Preference to serological.
NR / -	-	+	Patient may have recovered from a past infection; Antibody test may be false-positive	Consider COVID- or evaluate performing a new antibody test.
NR / -	+	+	Patient may be in the recovery stage of infection and PCR is false-negative; Antibody testing may be false-positive	Evaluate performing a new antibody test. Preference to serological.

NR - Not performed

**ALWAYS correlate with clinical picture**

Table 2 - Interpretation of the tests for the COVID-19 virus and the recommendation of conduct for each result.

For surfers who remain asymptomatic, surfing is allowed without further testing. However, asymptomatic surfers with a positive result for COVID-19 (active infection) should be advised not to perform physical exercise in general for at least 2 weeks from the date of the positive test result and follow the recommendations for social isolation for the same period. If surfers remain asymptomatic, the slow resumption of physical activity should be under medical guidance. For asymptomatic individuals with serology for COVID-19, we recommend an evaluation similar to that of the asymptomatic athlete with positive results on the COVID-19 test. Stratification of cardiovascular risk should be considered if there is concern about cardiac involvement.



Graph 3 - Illustration of the severity of symptoms related to the time of symptom onset. The blue lines illustrate different examples of symptom intensity in an uncomplicated setting, while the orange lines illustrate examples of cases with progression to symptom severity.

## 7.2 Cardiological Considerations

It is not yet established whether the increased risk of myocardial injury in patients hospitalized with COVID-19 may be similar in non-hospitalized or asymptomatic patients. However, we emphasize the need to carefully consider the possibility of cardiac injury in patients with positive COVID-19.

For this reason, we suggest that asymptomatic patients with positive COVID-19 should rest/not practice physical activity for 2 weeks after the positive test and receive regular follow-up for eventual onset/worsening of symptoms. The return to physical activity must be gradual and under the guidance of a medical team.

For positive COVID-19 surfers with mild or moderate symptoms, we suggest that rest/non-practice of physical activity occurs during the symptomatic period and extends for another two weeks after the resolution of the symptoms (with the exception of anosmia and/or ageusia). After this period, we recommend a careful clinical cardiovascular evaluation in combination with cardiac and renal and hepatic function biomarkers, resting electrocardiogram, with the possibility of imaging tests, spirometry and stress test/cardiopulmonary stress test.

COVID-19 patients who present moderate to severe symptoms, whether they have been hospitalized or not, represent a higher risk cohort. For those who were hospitalized with COVID-19, but whose cardiac biomarkers and imaging studies were normal, we recommend a minimum rest of 2 weeks after resolution of symptoms before undergoing a cardiovascular evaluation similar to that already described in this document, especially if has not been performed during hospitalization.

Patients with confirmed or high clinical, laboratory, electrocardiographic and/or imaging suspicion of myocarditis should follow the recommendations for the return to physical activity of patients with myocarditis from the American College



Remember that the use of hydroxychloroquine or chloroquine as a therapeutic and/or prophylactic proposal for COVID-19 can lead to ECG changes, such as prolongation of the QT interval. Therefore, such changes should always be investigated with the request for a resting ECG whenever the patient (symptomatic or asymptomatic) reports having used this medication.

COVID-19 patients may also present with acute coronary syndrome. One possible explanation is a pro-thrombotic state generated by COVID-19. Thus, depending on the clinical and/or laboratory severity (D-dimer) of the patient, it is not uncommon for patients with COVID-19 to be using some type of anticoagulant. For this reason, we recommend that the responsible physician be especially careful in monitoring patients who are practicing physical activity while using these medications. Another complication related to COVID-19 that must be evaluated is renal function.

As previously discussed in this document, we recall that many of the non-specific symptoms of myocarditis, some ECG changes and troponin levels, CPK/CK-MB can be confused or misinterpreted with conditions directly related to training. For this reason, we suggest using the International ECG Interpretation Criteria in Athletes 2016 to interpret electrocardiographic findings in athletes.

## 7.3 Orthopedic Considerations

In the orthopedic and performance scope, it is recommended that the return to physical activities (surfing itself or physical training) be carried out gradually. Measures such as: reducing the period of a session; ensuring adequate hydration, food and rest between sessions can be used in the initial phase of returning to surfing. For professional surfers, the training routine must respect the periodization established by your fitness team. Specific strengthening exercises should be evaluated according to the surfer's past orthopedic injuries.

We recommend a warm up session before entering the water for all surfers, aiming at a lower risk of injuries during the session.

Patients who required hospitalization due to COVID-19 must undergo a musculoskeletal functional evaluation to assess any possible muscle weakness that requires specific rehabilitation. Patients admitted to the ICU should be evaluated, including, to guide pulmonary rehabilitation.

Considering this topic, we suggest dividing athletes into three major groups:

A - Surfer with symptoms of COVID

B - Surfer recovered from COVID

C - Surfer not infected by COVID

The strategy for the 3 groups must always be multidisciplinary and communication between the health and technical teams (trainer and physical trainer) must be intensified. Group A surfers, from an orthopedic point of view, must remain at rest from physical activities, with a full focus on recovery and remission of symptoms as soon as possible, in order to minimize the harmful effect of the disease as much as possible. Group B, must perform an individualized orthopedic evaluation, in order to detect possible muscle and capsule-ligament sequelae - such as stiffness and joint range of motion imbalance. Group C, in addition to all behavioral measures to prevent infection by the virus, must maintain a plan to maintain cardiopulmonary and muscle conditioning to reduce losses caused by changing training patterns.

For all groups, it should be considered that the period of quarantine and social isolation can represent a period of significant decrease in the volume and intensity of training, with drastic changes in sports and life routine. Therefore, the orthopedic impact on the return of surfers to their normal activities should also be taken into account.

There is a belief by some surfers that more intense training or the same intensity as the pre-quarantine period is a

good strategy for a quicker return to previous physical capacity. However, after a prolonged period of reduced levels of physical activity and training, this approach can lead to reduced performance and/or serious orthopedic injuries. This behavior can appear in surfers of all levels, but it is important to pay more attention to professional surfers. Professional athletes normally strive for excellence and, without proper guidance, generally tend to exceed their limits. It is the group that normally reaches training levels beyond capacity as a necessary strategy for success.

For professional surfers, the competition environment must also be gradually established. The progressive adaptation to this competitive climate is essential to better adapt the body to adrenergic discharges.

For injury prevention measures to be effective, the surfer - especially the professional athlete - must comply with a strategic plan detailing their risks, recommended periodization, load management and strength training.

## 7.4 Mental Health Considerations

COVID-19 also has an impact on the mental health of all individuals. Surfing is an outdoor sport and related to nature, so the home quarantine can have a very important impact on the mental health of this population. Thereby, it is important that the health professional seeks to identify the demands of patients, offering support and adequate guidance to the presented picture.

In the acute phase of COVID-19 infection, effective communication, social contact (although remotely) can be of great help. In the recovery phase, it is suggested that a reassessment of the patient's psychological condition be carried out, to try to identify those who may have adverse psychological outcomes as a result of their experiences with COVID-19.

Patients who present psychological changes without enough intensity to fulfill diagnostic criteria for psychiatric disorders (“subclinical”) tend to meet diagnostic criteria for another disorder. In these patients with “subclinical” conditions, it is important to pay special attention to depressive and anxiety symptoms (including panic syndrome and post-traumatic stress disorder), which may be related to impaired social, family and work functioning . For these patients, active monitoring (continuous review) is recommended.

Referral to psychological services, seeking therapies such as trauma-focused cognitive behavioral therapy or cognitive processing therapy is appropriate especially for patients with moderate to severe symptoms related to acute stress disorder.

Once the absence of important organic changes as a consequence of the infection by COVID-19 that can contraindicate the practice of physical activity is proven, it is consistent to encourage the return to the practice of surfing in order to improve mental health. In this situation, we reinforce that the surfer follows the Recommendations for the Surf Session. Physical activity has proven to play an important role in mood stability and promotes a lower risk of psychiatric suffering, although there is no linear relationship between improving mental health and practicing physical activity.

## 7.5 Phases for Returning to Professional Sports

First, all guidelines, rules and regulations regarding the return to sport must be followed as established by national, state or local governments and health departments. All facilities, coaches, leagues and tournament directors must monitor the recommendations and guidelines established by the national, state and local levels.

As each city, municipality and state slowly return to participation in surfing, it is highly recommended that

athletes take a "phased approach" with a gradual increase in physical activity to decrease the risk of injury.

A careful approach to exercise offers athletes the chance to get used to the temperature and intensity/duration of sports. This slow increase in exercise can decrease the risk of injuries and illnesses caused by the environmental variation so frequent in surfing.

### 7.5.1 Planning your pre-season after the pandemic

As previously discussed in this document, the period of quarantine and social isolation may have represented a period of reduction in the levels of physical activity and surfing. In these cases, there is a concern with the increased risk of injury due to the fact that the athlete is "out of shape" and/or because he/she is looking for a rapid and abrupt increase in the time spent practicing, training or competing. As restrictions begin to ease in local communities, athletes, coaches and those responsible for the athlete are excited about the opportunities to return to exercise and sport. However, a weighted and oriented approach to physical exercise after sport withdrawal is important, in order to minimize the risk of acute injuries and overuse.

### 7.5.2 Gradual return

Many are starting at roughly the same point: pre-season. This stage of training aims to get your body moving and ready to compete.

Adjust the activity level to about 25-50% of the athlete's pre-pandemic activity level. This should include frequency, intensity, volume and training repetitions;

The first two weeks should focus on low to moderate intensity: light running, weight exercises;

The athlete can adjust or increase the workload by about 10 to 20% per week;

Take frequent breaks during exercise sessions;

Once you start - keep training! Muscle strength and recovery are improved with consistent training.

### 7.5.3 Acclimation

In combination with a gradual return to activity, it is equally important to talk about acclimatization.

Confined athletes should gradually get used to outside temperature over 10 to 14 days;

Control of the total practice time per day;

Consider alternating double practice days with a single practice day or rest day;

Athletes must complete the period of full acclimatization; if any athlete suffers from illness during this period, reclassification should be considered.

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[www.surfinjurydata.org](http://www.surfinjurydata.org)

Sede SP: Rua Major Natanael, 103  
Pacaembú, São Paulo - SP - CEP: 01246-100

Sede RJ: Av. Afonso Arinos de Melo Franco, 222  
Barra da Tijuca, Rio de Janeiro - RJ - CEP: 22631-455