# Target organ lung - diving after Covid 19 disease?

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https://www.wetnotes.eu/tauchen-nach-covid-19-erkrankung/

About the author:

Dr. Frank Hartig is the head of the emergency department (ER/shock unit) at the university clinic in Innsbruck (Tyrol, Austria) and the crisis coordinator / disaster officer for SARS-Covid-19 patients. Innsbruck is a current hot spot of the corona pandemic. His team is confronted with many questions, especially regarding the massive structural changes in the lungs. The first six recovered divers received preliminary bad news when it came to their routine fitness to dive examination.

Dear WETNOTES reader,

The corona pandemic is now part of everyday life and everyone is becoming increasingly impatient with efforts to return to normality at all levels as quickly as possible. For us divers, however, I would like to share a few important observations from reality and the research pipeline. As you may know, I am not primarily working as a diving doctor right now, but as an intensive care and emergency physician for many weeks directly on the front line. I don't want to jump on the train of so-called Corona experts. I'm just writing this much that the so-called Corona experts do not exist, because we all learn new things every day and many books will have to be rewritten. The virologists or epidemiologists can currently only help us very little, even if they are quoted daily in interviews and articles. At this point in time, we are all only relying on hindsight. Countless publications reflect the entire spectrum from serious reporting to conspiracy theories.

**Unsettling facts**

As a physician treating COVID-19 patients, who is definitely not an expert, I would like to draw your attention to a few exciting, but also worrying facts that will likely affect divers.

In the past few weeks we have had COVID-19 patients of all ages from the symptom-free spreader to intensive care patients on ventilators. The lungs are one of several target organs, and that obviously interests us as divers.

Six active divers were among our patients. While we had to wait up to 32 hours for test results in the first few days (so-called PCR test), radiologists observed that a CT scan of the lungs revealed very typical changes. So we quickly adapted to do chest CTs in addition to the PCR test. CT scans were also done in patients without cough or shortness of breath presenting with only fever and suspected COVID contact. Patients that displayed the typical lung changes were admitted to a station for 'suspected' Corona pneumonia until the test result came back. This knowledge is now published so that the diagnosis does not always require a positive PCR test in the smear, but a typical CT image might be considered sufficient.

It was and is interesting that there is a remarkable discrepancy between the diagnostics and the patient's perceived state of health. Young people in their best of age to be a diver walk into the emergency department, show normal vital signs and subjectively do not require oxygen. Contrarily, they display impressive bilateral infiltrates in their lungs, which look like one had put two wipes in a bucket of oil, pulled them out again and hung them up to dry. Other patients with the same appearance come to the clinic with reduced oxygen saturation. Except for an increased respiratory rate, which the patients hardly notice themselves, they are doing fine considering the circumstances, even though their blood gases are so bad that according to textbook, a physician would immediately think about intubation. If one then gives these patients 2 liters/min. of oxygen, the oxygen saturation will somewhat improve, but many of them end up in the intensive care unit with intubation and severe lung failure just a few hours later. Many colleagues feel that the oxygen triggers a cascade. None of us is prepared to explain, what exactly is going on there. It often looks scary, but let's not forget that about 80% of these patients seem to take it as if it was nothing.

One of the triggers for this interim report is an article by one of the world's most recognized divers / diving medicine experts and a person of great influence in the field, who claims that one could cure Corona by treatment with hyperbaric oxygen (HBO) therapy. This shows how far away some colleagues are from the front, sitting at their desks thousands of miles away from the patient and wanting only the best for us.

The first controls of the six divers mentioned earlier, who came to the controls clinically healthy after 5 to 6 weeks, are most exciting. In two of them, we observed significant oxygen deficiency during physical performance tests, which is a typical sign of a persistent lung shunt. In two we witnessed very excitable bronchial tubes during exercise, as typically found in asthmatics. In four of the six divers the control CT still showed impressive structural lung changes.

How this will turn out is completely unclear at this point, but for the reader should have understood what I was trying to emphasize in this article:

- None of the six divers can be cleared for diving for the time being despite their sense of wellbeing.

- We could potentially miss a number of young, COVID-cured divers, who quickly want to return to diving and appear healthy at first sight.
- Noticeable lung shunts resulting from the lung consolidations are not good for diving.
- Bronchial hyperexcitability / asthma are not good for diving.
- Hypoxemia during exercise is not good for diving.
- An increased susceptibility to pulmonary oxygen toxicity is not good for diving.
- And infiltrates / consolidations (lung areas that are not properly ventilated) have always been a strict contraindications for diving of any kind.

These effects obviously apply in the same way to freediving and scuba diving.

**Long-term damage?**

The extent to which long-term effects on the lungs will remain is unclear and currently speculative at best. We don't know how many of the changes will persist. When looking at the CT images, it is often difficult to imagine a complete recovery. What is certain is that those divers who, overall, feel healthy again, can still have serious diagnostic findings even after many weeks, which under no circumstances correlate with fitness to dive.

Within the next few months, these examinations will also have to be discussed controversially within the diving medicine community, focusing on whether divers should be examined differently or in more detail after a COVID infection. With this small number of cases, all findings are currently remain hypothetical and further studies will hopefully bring more clarity in the next year. We will stay extremely vigilant.

**Don't be reckless**

My personal assessment is that the active diver after a survived COVID infection should be examined very thoroughly by an experienced diving physician. Even more important: a diving professional should do everything possible to avoid becoming carelessly infected with COVID-19. This means group dives or diving excursions with the theme »everything but out-of-gas maneuver training« are not recommended under any circumstances and not at all professional.

In Tyrol we unfortunately also have a large number of young patients in the intensive care unit. The focus here is by no means about diving, but primarily about survival.

Our observations are currently in line with available publications, and we will certainly find out more about this from other research groups within the next year. We will keep the WETNOTES reader informed.

The thought that a drastic withdrawal from diving or even financial ruin will ultimately save us from an even bigger catastrophe can hopefully help us through this challenging time.

Be safe wherever you are

Frank Hartig

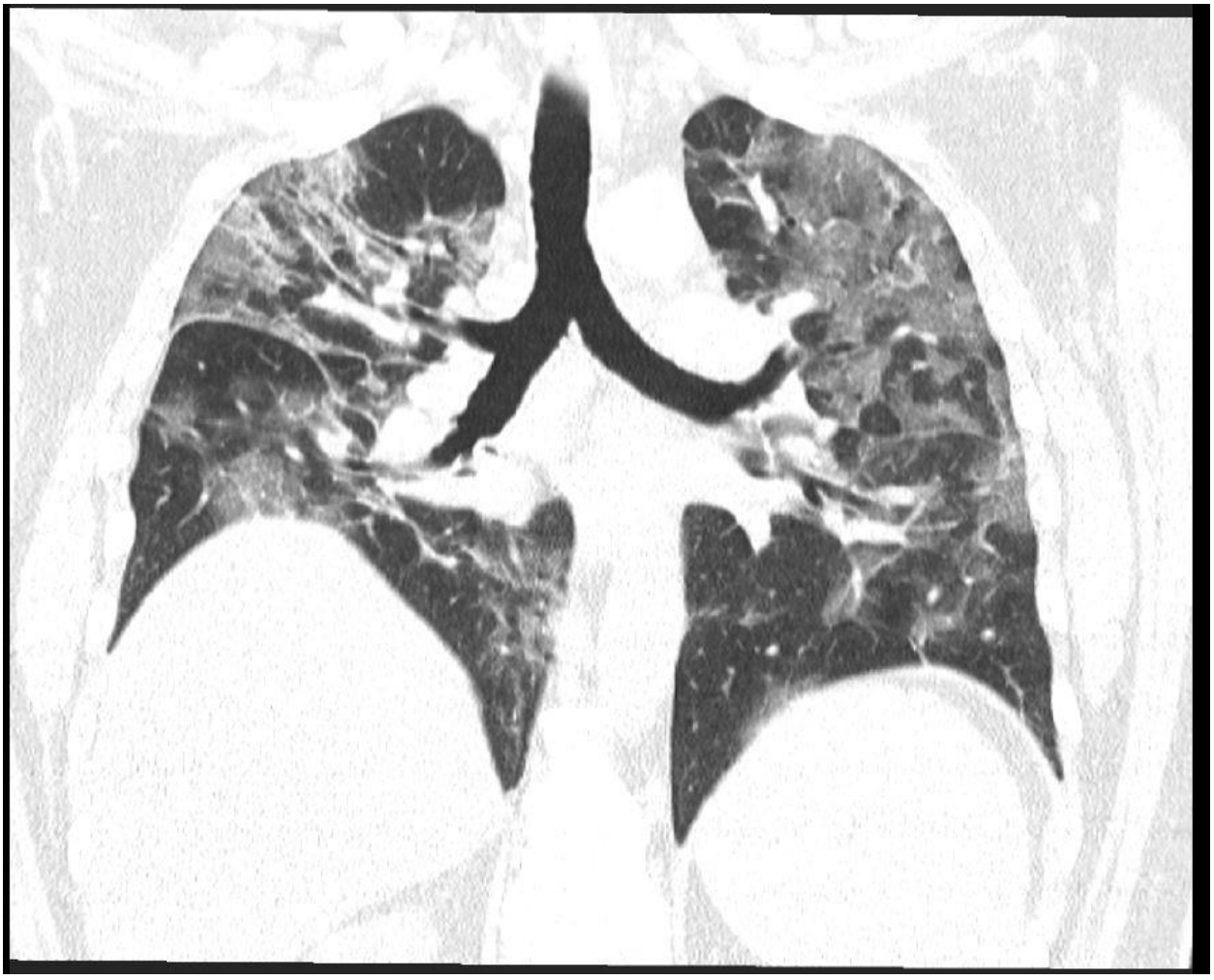

Fig. 1:

Lung CT of a 40-year-old patient, 6 weeks after COVID infection. Subjectively he feels well, with exertion (5 squats) his oxygen saturation drops (a sign of a lung shunt). Massive consolidations and infiltrates on both sides of the lung.