

IATF Statement on Post COVID

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The outbreak of Covid-19 has made the medical and scientific industry across the globe to pitch in together to stop the pandemic from causing loss of lives. Understanding and preventing the mode of transmission, documenting clinical presentation in acute phase, establishing treatment algorithms have been challenging goals for the medical faculty and researchers. The whole world has started bracing itself by developing vaccines and various treatment protocols to handle the pandemic.

IATF has been a preferred partner in Aquatic education and the current statement is an attempt by the Team of IATF to provide a statement in possible support of aquatic therapy intervention in alleviating the symptoms and aiding functional recovery in patients with Post Covid.

While most people with COVID-19 recover and return to normal health, a quarter of the infected people may experience symptoms that continue for at least a month; more than 1 in 10 may remain unwell after 12-weeks, and others may have ongoing symptoms for poster than 6 months.¹⁻³ The post-acute sequelae of COVID-19 have been described by patient groups as “post COVID”, and as “post-COVID conditions” by the World Health Organization (WHO) and United States Centers for Disease Control and Prevention (CDC).^{4,5} Post COVID is an emerging condition that is not yet well understood, but can be severely disabling, impacting people, regardless of hospitalization duration or severity of acute COVID-19.⁶

It is imperative to identify patients having symptoms of post Covid and patients having post intensive care syndrome following the infection of Covid. Such occurrences can be due to some patients requiring proposed admission in Intensive care unit.⁷ The possible therapeutic management will require clear understanding of the prevailing functional deficits and developing a strategy for recovery. Aquatic Therapy has possible evidence to be beneficial in either of the conditions. This statement by IATF has explored the evidences for such benefits from reviewing literature scoping the benefits of water immersion and exercises in clinical conditions that mimic the symptoms of post COVID.

- Current knowledge demonstrates that post COVID can affect multiple body systems including the respiratory, cardiovascular, renal, endocrine, and immune systems. Post Covid can be multi-dimensional, spanning symptoms and impairments across neuromuscular, mental, and cognitive functions.⁸⁻¹⁰
- Post COVID may also be experienced as episodic and unpredictable in nature, with symptoms fluctuating and changing over time while causing an impact on people's functional ability, social and family life, ability to work, and quality of life.^{6,11,12}
- People with post COVID present with clusters of overlapping symptoms such as fatigue or exhaustion, chest pressure or tightness, shortness of breath, headache, and cognitive dysfunction.^{13,14}
- Minor symptoms are treated symptomatically with medications. Etiology behind the symptoms, if any, like pulmonary embolism, cerebrovascular accident, coronary artery disease, must be treated as per the standard protocol. Chest physiotherapy and neuro rehabilitation is important in patients with pulmonary and neuromuscular sequelae.¹⁵
- At the time being, there is little evidence to support any specific way of handling post COVID syndromes due to the limited understanding of this newly emerged disease. Current clinical guidelines and reviews suggest holistic and multidisciplinary approach to deal with such complexity.^{11,16,17} Though rehabilitation is believed to be beneficial for post COVID,^{18,19} it should be noted that any rehabilitation program should only happen after evaluating for symptoms that need further investigation to ensure the treatment is rendered safely.²
- Since it is a new disease, the knowledge regarding post term effects and treatment options are still evolving. The exact pathophysiological mechanism of symptoms is yet to be identified and it may vary from individual to individual with multiple mechanisms contributing to symptoms.¹⁵

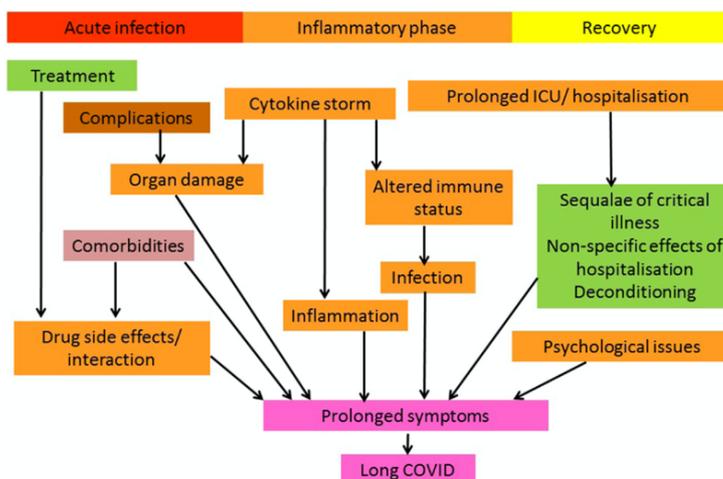


Fig. 2. Various pathophysiological mechanism of "Long COVID".

- Considering the benefits of water immersions and several adjustable factors utilizing physical and fluid mechanical properties of water²⁰, aquatic therapy might be able to play a role in the rehabilitation program.
- Implementation of aquatic therapy, has to follow the principles suggested by current guidelines, indicating that treatment needs to be individualized, based on each patient's condition, and the therapists must work in coordination with interdisciplinary professions.^{2,11,21}
 - **Chronic Fatigue Syndrome (CFS):** Existing literature identifies similarities between CFS and post COVID.^{22,23} This necessitates the therapist to navigate carefully in drawing parallel therapy options between the two. The intention needs to be for not causing harm but to facilitate recovery; vital sign – such as oxygen saturation, heart rate and subjective scales for observing fatigue – should be monitored closely and constantly. The exercise program treating fatigue, pain, and physical functions usually starts with low intensity and increase in a gradual graded manner.²⁴
 - Patients with CFS may experience onset of a key symptom - Post Exertional Malaise (PEM). It is described as a cluster of symptoms following mental or physical exertion, PEM often involves a loss of physical or mental stamina, rapid muscle or cognitive fatigability, and sometimes lasting 24 hours or more.²⁵ Pacing, or activity management, guided by perceived symptom levels encourages engagement in activities and avoids exacerbation of symptoms, conserving energy and enabling participation in meaningful activities.²⁶
 - Self-paced exercise could be designed and safely performed in aquatic therapy setting for people with ME/CFS.²⁷ Moreover, water-immersed environment could provide physiological benefits for reducing pain, fatigue, mechanical loading on joints, as well as increase blood flow and muscle relaxation, potentially aiding recovery from exertion.
 - **Shortness of Breath:** Breathless is a common manifestation following COVID-19 infection and in people with post COVID and thus pulmonary or respiratory rehabilitation is recommended.²³ Though head out of water immersion may increase abdominal or chest wall pressure, the unique properties of water could provide a high-support, low-impact environment which enables higher intensity and duration of exercise while sustaining oxygen saturation.^{28,29}
 - In this perspective, water-based training for respiratory dysfunction might be a suitable alternative for people with difficulty in completing land-based training programs or in people with comorbidities.^{28,30}
 - Starting at depth below chest level and progressing towards shoulder depth over period of intervention has been proven beneficial by Aquatic therapists rendering therapy sessions to patients recovering from post Covid. As this is an anecdotal evidence, essential observation, monitoring and precautions are recommended.
- **Muscular Symptoms:** Muscular pain, tightness and weakness might occur in post COVID.^{13,14} However, some neuromuscular weakness could be the resulted of post intensive care syndrome (PICS), which is different from post COVID.⁶

- Immersion in water with suitable warmth has effect on easing pain and reducing stiffness. In addition, specific properties of water could be used to provide graded exercise, as these allow for ease of movements, and hence prompt better conditions for exercise programs.³¹
- **Cognitive Dysfunction or “Brain Fog”:** Many people with post COVID experience “brain fog,” which demonstrates as confusion and memory loss.² It may vary between individuals and has been attributed to various mechanisms.²³ It can also be part of pre-existing CFS.³²
- In previous studies, immersion in water was found to increase cerebral blood perfusion³³ and seemed to enhance the cognitive performance.³⁴ Other studies have demonstrated movement in water has an influence on the cortical activation, providing support for aquatic intervention for facilitating cognitive dysfunction.³⁵
- Water immersion with activities challenging the cognitive tasks in water can have positive influence on improving cognitive abilities.³⁶
- Monitoring of vital signs before, during and after the therapy sessions are essential to document any positive or adverse response that would alter the programs design in the following sessions.¹⁵
- Using the appropriate outcome measures for fatigue, muscle weakness, dyspnoea, cognitive function, quality of life will be crucial to determine the impact of aquatic intervention in these people.
- Post COVID patients with associated comorbidities such as diabetes, obesity, cardiovascular disorders, and any preexisting health concerns must be monitored closely because water environment might impact the system differently.
- At the moment, evidence-based recommendation for any specific intervention approach is limited. For people with greater functional limitation and comorbidities, aquatic therapy is a potential alternative to successfully proceed the rehabilitation program. Decision making for exercise choice should be based on not only the best available expertise of the therapist and practical considerations, but also preferences of the patients.
- Providing patient education and orientation to the pool environment will assist the patients to participate in decision making. With the paradigm shift in health care delivery, the one that has garnered most attention is the aim for health care to be "patient-centered by providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions."³⁷
- Patient-centered care (or person-centered care) empowers patients to actively participate in decision making, which is ought to be established for setting post COVID treatment plan.³⁸ Considering the clinical complexity and uncertainties of post COVID, functioning therapeutic relationships are critical in maintaining safe

rehabilitation approaches, through recognition, validation and inclusion of patient experiences as a means of personalizing treatment. This mode of healthcare delivery can be applicable in strategic aquatic therapy planning for patients with post Covid.

- As there may not be definite guidelines for choosing aquatic therapy as therapeutic approach for assisting recovery from post Covid; this statement identifies certain situations where aquatic therapy can be a choice.
 - Physical weakness that constrains patients from training on land (e.g., obesity, deconditioning).
 - Benefits of water immersion that may improve muscle work efficiency, relaxation and oxygenation apost with providing a safe environment in reducing the injuries owing to risk of fall.
 - As an alternative approach to explore when there is a recovery plateau (e.g., the improvement slows down or remains at same level for 2 weeks after land-based therapy).
 - Patient preferences as one of the indications of starting or continuing aquatic therapy.
- While Aquatic therapy can support recovery in patients with postCOVID, a certain precautionary measures may be essential or therapy may be differed in the certain clinical situations.
 - Irrecoverable desaturation < 90% with periodic testing on a pulse oximeter in the facility.
 - Mean arterial pressure (MAP) < 65 mmHg tested on sphygmomanometer in the facility.
 - Severe Tachycardia or Cardiac arrhythmias.
 - Severe neurological dysfunction – lack of cognitive abilities to follow instructions.
 - Active infections – fever.
 - Systemic conditions limiting water immersion.
 - A repeat positive test result resulting in aggravation of symptoms requiring medical attention.
 - Patient preferences – finds land therapy effective.
- The pathophysiology of the post COVID remains unclear and the post-term effects of any treatment still need further exploration and research. The current recommendations are based on the prevailing data and might change based on the data obtained in future.

Disclaimer: The Association IATF has based its statement on the best available information. IATF excludes any liability for any direct, indirect, incidental damages or any other damages that would result from, or be connected with the use of the information presented in this document.

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