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The English Translation Of Your Phrase Is: "Post-Covid-19 Lung Changes And Rehabilitation Methods"

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Annotation: This article analyzes the significance, types, and objectives of the rehabilitation process after COVID-19. Rehabilitation plays a crucial role in restoring physical, cognitive, and mental health, as well as improving the quality of daily life for patients. The article highlights key areas such as physical therapy, occupational therapy, speech therapy, pulmonary rehabilitation, and mental health therapy. It also provides information on developing individualized rehabilitation plans, assessing patients' needs, and monitoring recovery progress. The recommendations emphasize the importance of a personalized approach, interdisciplinary collaboration among healthcare professionals, and social support. Rehabilitation is considered a key factor in returning to a healthy life, regaining independence, and enhancing psychological resilience after COVID-19.
Keywords: COVID-19, rehabilitation, physical therapy, occupational therapy, speech therapy, pulmonary rehabilitation, mental health, cognitive recovery, healthy lifestyle, independence.

Introduction: From 2002 to 2004, coronaviruses of the Betacoronavirus genus (reservoir – bats) caused the first atypical pneumonia epidemic of SARS-CoV, resulting in 774 human deaths across 37 countries. The next coronavirus epidemic was also caused by a Betacoronavirus and was named MERS-CoV, or Middle East Respiratory Syndrome (reservoir – dromedary camel), which, from 2012 in the Arabian Peninsula (82% in Saudi Arabia) until 2020, caused 866 deaths. Cases of this infection are still being reported [1]. SARS-CoV-2 is a single-stranded RNA virus belonging to the Betacoronavirus genus of the Coronaviridae family. Genetically, the genome of SARS-CoV-2 is 79% similar to that of SARS-CoV. The current SARS-CoV-2 strain was first identified in December 2019 in a patient hospitalized in Wuhan, initially classified as the L clade. In January 2020, it mutated and spread as the S clade. Later, the O clade and the Omicron variant emerged and continue to cause infections. At room temperature (20–25 °C), SARS-CoV-2 can survive on dry surfaces for up to 3 days and in liquids for up to 7 days [2]. The virus remains viable at pH 5 to 9 and can survive for up to 6 days at pH 4 or pH 11. At +4 °C, it can survive for 14 days, at 37 °C for 1 day, at 56 °C for 45 minutes, and at 70 °C for 5 minutes. The virus is sensitive to ultraviolet radiation and working solutions of disinfectants. The entry route of the pathogen is through the epithelium of the upper respiratory tract and the epithelial cells of the gastrointestinal tract. SARS-CoV-2 binds to target cells that express angiotensin-converting enzyme 2 (ACE2) receptors to enter the body. According to modern understanding, ACE2 and TSP2 are located on the surface of various cells in the respiratory organs, esophagus, intestines, heart, adrenal glands, urinary bladder, brain (hypothalamus), pituitary gland, as well as endothelial cells and macrophages.

However, based on the ability of SARS-CoV-2 to damage various organs and tissues, it has been suggested that, in addition to ACE2, the virus may have additional receptors and coreceptors [3]. Most often, the primary and rapid entry route of SARS-CoV-2 is through alveolar type II cells in the lungs, leading to the development of diffuse alveolar damage. The virus can also cause catarrhal gastroenterocolitis because it infects epithelial cells of the stomach, small intestine, and large intestine that express ACE2 receptors. However, its morphological characteristics have not yet been studied in sufficient detail.

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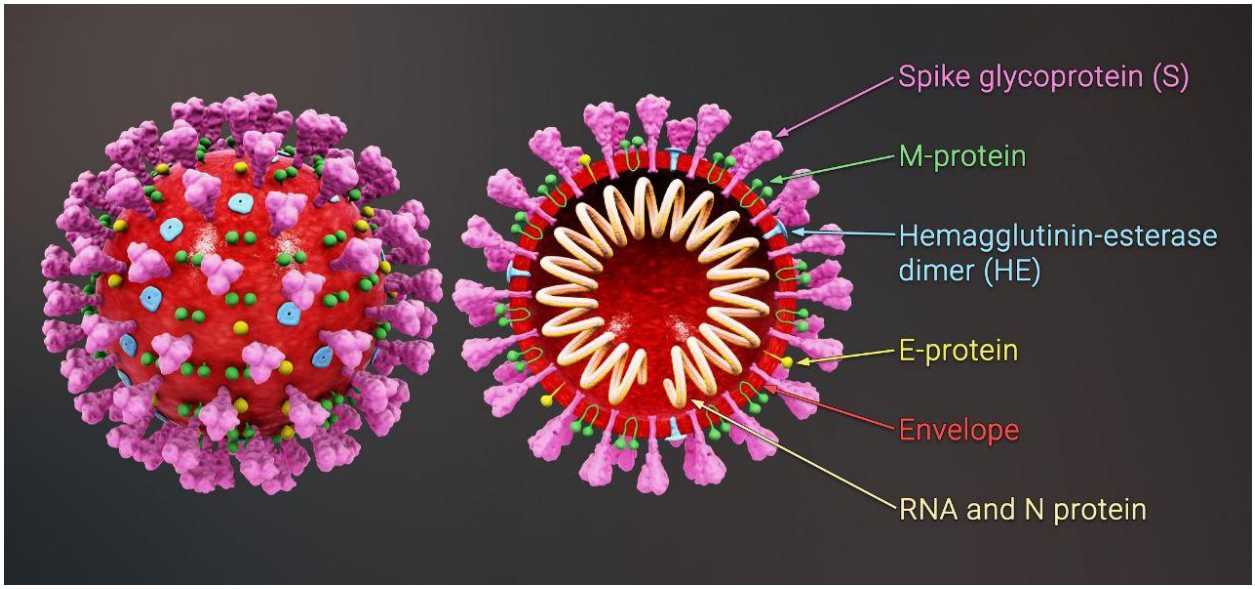
Figure 1:



Virological structure of the SARS-CoV-2 virus.

Relevance: The COVID-19 pandemic has been one of the most serious global health challenges in human history, particularly causing profound and long-term effects on the respiratory system, especially lung tissue. Many patients who have recovered from the disease exhibit post-COVID syndrome, which not only leads to general weakness and fatigue but also results in fibrotic changes in the lungs, impaired ventilation, reduced gas exchange, hypoxemia, and respiratory failure [4,5]. Recent medical studies indicate that 30–50% of patients who experienced severe COVID-19 continue to have various structural and functional changes in the lungs. This not only affects the respiratory system but also indirectly impacts the cardiovascular, musculoskeletal, and nervous systems. Therefore, post-COVID rehabilitation, particularly pulmonary rehabilitation, is an essential part of returning to a healthy life [6,7].

Main Part: Post-COVID-19 rehabilitation goals may include restoring physical function, improving respiratory function, managing fatigue, addressing cognitive changes, and providing emotional support. It is important for individuals to work with healthcare professionals to create a personalized rehabilitation plan that meets their specific needs and goals [8,9]. Overall, post-COVID-19 rehabilitation is essential for promoting recovery and improving overall quality of life. COVID-19 can cause a wide range of symptoms, including fever, cough, difficulty breathing, fatigue, body aches, loss of taste or smell, headache, sore throat, and congestion. In some cases, more severe conditions such as pneumonia, acute respiratory distress syndrome (ARDS), and organ failure may occur [10,11].

Even after recovering from the acute phase of the illness, some individuals may experience long-term effects that can impact physical, cognitive, and emotional functions. These include persistent fatigue, muscle weakness, joint pain, shortness of breath, difficulty concentrating or remembering, depression, anxiety, and post-traumatic stress disorder (PTSD). Rehabilitation helps to address these long-term effects and improve overall functioning and quality of life [12,13].

There are several types of rehabilitation that may be beneficial for individuals recovering from COVID-19:

1. Physical Therapy: Physical therapy helps individuals restore strength, mobility, and endurance after being bedridden or sedentary during illness. A physiotherapist can develop a customized exercise program to address specific areas of weakness or pain.

2. Occupational Therapy: Occupational therapy assists individuals who experienced significant physical or cognitive impairments during illness in relearning daily living skills such as dressing, personal care, and cooking.

3. Speech Therapy: Speech therapy supports individuals who had difficulties with speaking or swallowing during illness. A speech therapist can provide exercises to improve these functions and, if needed, assist with communication devices.

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4. Pulmonary Rehabilitation: Pulmonary rehabilitation can help individuals who experienced respiratory complications during illness, such as pneumonia or ARDS. This type of rehabilitation focuses on breathing techniques and improving lung function.

5. Mental Health Therapy: Mental health therapy can support individuals experiencing depression, anxiety, or PTSD related to their illness. A therapist can provide coping strategies and assistance for emotional healing.

Overall, rehabilitation can be an important part of the recovery process for individuals who have experienced COVID-19. A healthcare provider can help determine which type of rehabilitation is most appropriate based on the person's specific needs and symptoms.

Rehabilitation goals may vary depending on an individual's condition and needs, but some common objectives include:

1. Improving overall quality of life: Rehabilitation aims to enhance an individual's physical, emotional, and social well-being. This may include reducing pain, improving mobility, and participating in daily life activities.

2. Promoting independence and self-care skills: Rehabilitation helps individuals restore or develop skills necessary for independent living, such as dressing, personal care, and cooking. This can increase their confidence and self-esteem.

3. Supporting social reintegration: Rehabilitation is aimed at helping individuals reintegrate into their communities and social networks. This may involve improving communication skills or providing opportunities for social interaction.

4. Preventing secondary complications: Rehabilitation helps prevent complications arising from the individual's condition, such as pressure sores or muscle weakness.

5. Educating patients and caregivers on self-management strategies: Rehabilitation provides education and training on self-management strategies that help individuals maintain their progress after completing the rehabilitation program. This includes exercise programs, dietary modifications, and medication management.

A personalized rehabilitation plan is developed based on an individual's specific needs and goals. This plan may include:

1. Assessment: The rehabilitation team evaluates the individual's physical, emotional, and social functioning and identifies their strengths and areas of need.

2. Goal Setting: The individual and the rehabilitation team work together to set realistic and achievable goals for the rehabilitation process.

3. Treatment Plan: The rehabilitation team develops a treatment plan that includes specific interventions to address the individual's needs and goals. This may include physical therapy, occupational therapy, speech therapy, or counseling.

4. Monitoring and Adjustment: The rehabilitation team monitors the individual's progress and adjusts the treatment plan as needed to ensure continued advancement toward their goals.

5. Discharge Planning: The rehabilitation team works with the individual and their caregivers to develop a follow-up care plan after the rehabilitation program ends. This may include follow-up appointments, home exercise programs, or referrals to community resources.

Rehabilitation is particularly important for individuals recovering from injury, illness, or disability, as it helps restore independence and improve quality of life. It assists in regaining physical abilities such as strength, mobility, and coordination, as well as enhancing cognitive and emotional functioning. Additionally, it helps individuals learn new skills and strategies to manage their condition and prevent future complications.

Rehabilitation can also have a significant impact on mental health and well-being. It helps reduce anxiety, depression, and stress associated with living with a disability or chronic illness. By improving physical and emotional functioning, rehabilitation can increase self-esteem and confidence, enabling fuller participation in personal and professional life. Overall, rehabilitation plays a vital role in helping individuals achieve their goals and improve their overall quality of life. Through personalized care and support, rehabilitation empowers people to overcome challenges in their condition and lead a fulfilling life.

Conclusion: Rehabilitation after COVID-19 or other severe illnesses plays a crucial role in restoring health and improving quality of life. Rehabilitation helps restore physical strength, improve breathing,

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stabilize mental well-being, and support a return to independent living. It also assists individuals in relearning daily living skills, such as walking, speaking, eating, and self-care.

Recommendations:

1. It is necessary to develop an individual rehabilitation plan for each patient.
2. Physical, speech, occupational, and mental health therapies should be applied together.
3. Family and social support for patients is important during rehabilitation.
4. Patients should be educated on exercises, healthy nutrition, and proper medication use. This approach helps individuals maintain their health and return to normal life more quickly.

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