

# POST COVID - 19 REHABILITATION

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## **INTRODUCTION:**

The Covid 19 - pandemic has thrown the world into chaos and misery. Human kind has been exposed and all the defences have been breached by this pandemic. As of today around 200 million have been infected and 4.2 million have died. Coronavirus proved to be resilient and rapidly spreading infection thereby exponentially increasing its victims. Once infected, it takes not less than 2 weeks to recover from it. Few of them are left with many distressing ailments then after. COVID – 19 spares none, it has the propensity to affect blood to bone, brain to heart, lung to liver. Our effort, money and focus has always been on the prevention and treatment. Post – covid rehabilitation is often neglected and it now is posing greater challenge to health care professionals. This article is an effort to create awareness on post covid – 19 rehabilitation.

Post covid rehabilitation comprises a comprehensive set of practices which diminish the postinfection adverse effects and reverts the body to its normal functioning. The faster the recovery, less likely are the post infective complications. Rehabilitation should begin at the earliest and in various stages namely immediate, short term and long term.

Rehabilitation process requires a multidisciplinary team which includes psychologist, respiratory therapist, physiotherapist and rehabilitation physician to chalk out a plan and address various post covid issues based on patients needs.

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In a study published by Angelo Carfi et al. stated that out of all the patients discharged from hospital, around 87 % had at least one symptom.

2 Commonly observed sequelae in the so called ' POST COVID

LONG SYNDROME' 3

are: Pulmonary sequelae: hypoxia, dyspnoea, reduced exercise tolerance. Cardiovascular sequelae: palpitations, dyspnoea, chest pain. Endocrine sequelae : worsening of underlying diabetes mellitus, thyroid disorders and osteoporosis. Renal sequelae : decreased urine output. Gastrointestinal sequelae: constipation, acid peptic disease. Dermatologic: hair loss reported in 15 percent of patients. Psychiatric sequelae : anxiety, depression, insomnia, post traumatic stress disorder. Neurological sequelae : headache, seizures, encephalopathy. Musculoskeletal sequelae: Myalgias, fatigue.4

**Cardiac rehabilitation<sup>5,6</sup> :**

A complete initial assessment by 6 minute walk test, short physical performance battery to evaluate lower extremity function and mobility , prevailing impairments in activities of daily living. Endurance training : continuous exercise periods of 15 to 20 mins of low to moderate intensity atleast 3- 5 times per week. Resistance training: 8 – 12 repetitions of moderate intensity exercises with 2-3 minutes of rest , 2-3 times per week. Benefits : Blood pressure reduction, increase in arterial compliance, increase in anti-oxidant and anti-inflammatory mediators, improved endothelial function. Parameters : Saturations above 93 %, Heart rate and blood pressure not to exceed more than 20 % from baseline and worsening of existing cardiac symptoms. ISCCM recommendation (weak), Level of evidence II B

**Pulmonary Rehabilitation<sup>7</sup>:**

Initial assessment includes pulmonary function tests, evaluation of respiratory muscle strength; maximum inspiratory pressure and expiratory pressure and Barthel index to evaluate activities of daily living. Breathing exercise: posture management, adjustment of breathing rhythm, thoracic expansion training, mobilisation of respiratory muscle groups. Airway clearance by forced expiratory techniques to clear sputum and reduce coughing . Aerobic exercises and balance training: brisk walking, slow jogging, swimming and hands free balance training with help of balance trainer. They should be started at low intensity and increased progressively. Benefits: improved survival, improved exercise tolerance, improvement in airway clearance of secretions, improvement in respiratory muscle function, minimize COPD symptoms Parameters : Spo<sub>2</sub> < 92 %, Borg dyspnoea score > 3, chest tightness, blurred vision, palpitations, wheeze, excessive spiral coughing'. ISCCM recommendation (moderate), Level of evidence II A

**Endocrine rehabilitation <sup>8, 9, 10</sup>:**

Endocrine sequelae may be a result of direct viral injury to endocrine organs, immunological and inflammatory damage. Initial assessment includes pre – existing diabetes, thyroid disorders, exposure to corticosteroids, vitamin D insufficiency, cortisol levels. Endocrinologist role: need to diagnose endocrine disorders such as adrenal insufficiency, autoimmune thyroiditis, diabetes mellitus and devise a comprehensive treatment. Proper nourishment: total calorie requirement is 25- 30kcal/ day and 1.5g protein/kg/day. Adequate supplementation of Vitamin – D as these patients are lack sun exposure due to prolonged hospital stay. Adrenal insufficiency: chronic condition where there is diminished cortisol production and hormonal replacement therapy may be required to restore plasma cortisol levels. Life style modifications: Regular exercise, timely and adequate sleep, reduce work stress and participation in recreational activities. Benefits: better glycemic control, reduced risk of cardiac and neurologic complications, early return of body to normal functioning state, improves recovery rate from covid -19 and reduced psychosomatic disturbances

ISCCM recommendation (weak), Level of evidence II B

### **Neurological and neuro psychiatric rehabilitation 11:**

Covid-19 induced vasculitis, endothelial injury, microvascular thrombosis, hypercoagulability, deep vein thrombosis result in stroke. Cytokine storm damage and increases blood brain barrier permeability leading to release of pro inflammatory mediators. These mediators activate microglia and astrocytes which phagocytise damage cells causing neuroplasticity, altered learning, hallucinations. Increased inflammation also reduces neurotransmitter production and thereby inducing depression, anhedonia, psychomotor and neuro vegetative symptoms. Neuro – neuro psychiatric rehab goals: Constant help of patients with their activities of daily living. Stress , depression, anxiety management. Activities to improve mobility, balance and gait. Social and behavioural skills retraining. Pain management and emotional support. Activities to improve cognitive impairment, concentration and memory. Nutritional and vocational counselling. Bladder and bowel retraining. Various exercise programs to improve movement in limbs with respect to range of movement and reduce muscle spasticity.

ISCCM recommendation (weak), Level of evidence II B

### **Musculoskeletal Rehabilitation 12,13:**

Apart from severe muscle weakness, reduced joint mobility, muscle pain, Critical illness polyneuropathy and critical illness myopathy are disabling conditions seen in patients who have suffered from severe covid-19 infection. Critical illness polyneuropathy is a sensorimotor neuropathy due to axonal degeneration. It is characterised by generalised weakness, sensory loss, atrophy , reduced deep tendon reflexes and associated with pain, diminished range of movements, dysphagia, fatigue, anxiety. Muscle biopsies are taken and electromyographic testing is done for diagnosis. Critical illness myopathy is diffuse non necrotising myopathy due to fatty degeneration and muscle fibre atrophy. Use of corticosteroids, muscle paralytic agents and sepsis predispose to CIM.

Early mobilisation: Bed side mobilisation and ambulation, frequent posture changes. Physical therapy pyramid: progression of rehabilitation program in a sequence comprising of performance , function, balance, co ordination and agility, strength and endurance, flexibility and range of motion. ISCCM recommendation (weak), Level of evidence II B

### **CONCLUSION:**

Recovery from an infection is only complete when the body is back to its normal functioning status. Rehabilitation thus has a pivotal role in recovery. Rehabilitative care has proved to reduce hospital re – admissions, improve performance of activities of daily living, enhance the immune system, help gain control over pre existing comorbidities (hypertension, diabetes mellitus, COPD, thyroid disorders), improve psycho social behaviour, improve respiratory muscle function and exercise tolerance. Thus it reduces the disability adjusted life years. Rehabilitation may be a long journey nonetheless the right path to recovery and it only gets better with time.

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