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MANAGEMENT OF PATIENTS WITH POST-COVID SYNDROME IN FAMILY MEDICINE PRACTISE

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The diverse range of COVID-19 symptoms has made a number of people to worry about the effects of the disease on the body in the long run, thus post-COVID syndrome. Generally, the condition develops around the time when individuals have recovered from the initial infection with the SARS-CoV-2 virus. General practitioners are the first people to whom the patients present their complaints; thus, they are responsible for diagnosing the disease, recognizing its nature, studying it by various means, and keeping the patients' health under their constant supervision. The authors through their article comprehend signs of the post-COVID syndrome and give examples from the family doctor's practice to clarify how they detected and treated it. The paper's major contribution is the healthcare team's collaboration for the examination, treatment, education of the patient, and interval of rehabilitation [1].

The COVID-19 pandemic has brought massive changes to the world's health conditions. The number of patients who have recovered is very high now; however, a considerable number of people are still having the virus for a long time after the acute period has ended. Post-COVID syndrome is a better term for this health condition that refers to a cluster of physical, cognitive as well as emotional symptoms that accompany one another [2]. The most common symptoms are: fatigue, shortness of breath, chest pain, mental problems, and mood disorder.

Primary care is still the main source of patient-centered care which can be individualized according to the patient. Furthermore, the center through the care givers is obliged to start, execute and support the process of giving the continuous care, etc., test and treatment grounds provision, and patient health status and recovery supervision post-COVID syndrome. The circumstances put forward primary care as a direct and indispensable player when the syndrome is still recent and there are many different presentations [3]. The main goal of this paper is to keep family medicine doctors and other health care workers posted about clinical diagnosis, current research on etiology, diagnostic methods, and therapy in post-COVID syndrome.

Long COVID is a term that is sometimes used interchangeably to refer to the condition described by persistent symptoms after the initial infection. For instance, after research, scientific papers, and literature, the word itself appears in new documents related to it. Research has revealed that even individuals with mildly symptomatic cases can show signs of these symptoms, which last for weeks or even months. Long-COVID's physiopathological basis is unclear, but a lingering viral infection can still interact with the immune system resulting in it being deregulated, vascular endothelium being dysfunctional, and persistent inflammation still existing [4].

It was assumed that the percentage of survivors of COVID-19 who would require post-acute care might be between 10% and 30%. A low level of energy and shortness of breath are symptoms most commonly seen together, and neurocognitive symptoms like forgetfulness, disorientation are the ones most frequently reported. The patients, besides having mental illnesses that existed before, e.g., anxiety, and depression, also have these conditions in a large number of patients, which makes their treatment more difficult.

The doctors are familiar with the latest revelations and practical guidance if they want to ensure not only the efficient control of the cases but also the patient's quick recovery. A patient-centered culture and technological innovation do not work in isolation but rather interact synergistically, patient-centered tailored care being a positive example of the solution [5].

Post-COVID syndrome manifests itself in many ways. Most of the symptoms of the five areas can be found, i.e., respiratory, cardiovascular, neurological, psychological, and general manifestations.

Table 1. Common Clinical Manifestations of Post-COVID Syndrome [4].

Symptom Category	Specific Symptoms	Frequency	Notes for Family Physician
Respiratory	Shortness of breath, persistent cough, reduced exercise tolerance	High	Monitor oxygen saturation, consider pulmonary function tests
Cardiovascular	Chest pain, palpitations, arrhythmia	Moderate	ECG, referral to cardiologist if persistent or severe
Neurological	Brain fog, headaches, dizziness, neuropathic pain	High	Cognitive assessment recommended, neurological referral if needed
Psychological	Anxiety, depression, mood swings, PTSD	Moderate	Screening with PHQ-9, GAD-7; refer to mental health services
General	Fatigue, malaise, muscle/joint pain	Very high	Encourage pacing and gradual return to activity
Gastrointestinal	Diarrhea, nausea, abdominal discomfort	Low	Rule out other causes, supportive care
Dermatological	Hair loss, rashes	Low	Usually self-limiting, monitor progression

The family doctors cannot solve a variety of symptoms unless they have an overview of all the facets. Some fundamental questions should be asked from family doctors, and standardized screening methods should be used to detect a pattern of symptoms and exclude other diseases.

Role of the Family Physician

The family doctor is the first contact who holds the key in the treatment of post-COVID-19 patients as he/she can cover the entire patient care journey. The functions of the family doctor are illustrated in the following list:

● Early recognition: It is about differentiating those patients who have symptoms that last for four weeks after the acute phase of the disease.

● Comprehensive assessment: Determining the physical, cognitive, and emotional health aspects of the patient by using scale tools.

● Care coordination: Patient consultation with the needed specialists at the right hour, e.g., pulmonologists, cardiologists, or neurologists [6].

Patient education: Informing patients about symptom management, not being too active, and having the right recovery expectations.

Monitoring: Symptom recording and keeping records, drug side effects, and patient functioning during the entire treatment period.

Table 2. Practical Recommendations for Family Physicians in Managing Post-COVID Syndrome [7]

Area	Recommendations	Actions
Assessment	Comprehensive evaluation of physical, cognitive, and mental health	Use structured history, validated questionnaires, basic labs, and targeted imaging if indicated
Symptom Management	Treat specific symptoms individually	Pain management, respiratory therapy, sleep hygiene, pharmacological support as needed
Rehabilitation	Encourage gradual, structured physical and cognitive activity	Tailor program to patient's tolerance, monitor progress, adjust intensity slowly
Mental Health	Screen for anxiety, depression, PTSD	Provide counseling, consider referral to psychologist or psychiatrist
Patient Education	Explain post-COVID syndrome and expected course	Provide printed or digital materials, discuss realistic recovery goals
Care Coordination	Collaborate with specialists	Pulmonology, cardiology, neurology, rehabilitation services as required
Follow-Up	Regular monitoring of symptoms and functional status	Schedule visits every 4–6 weeks initially, adjust based on patient recovery

Family physicians also play a key role in identifying patients at risk of severe complications and in providing reassurance to those experiencing prolonged but non-life-threatening symptoms.

Post-COVID syndrome management should be tailored to the individual patient and include more than one method of treatment:

● Pharmacotherapy: Painkillers for the pain, respiratory therapy for breathing difficulties, and cognitive exercises for the mind.

● Physical rehabilitation: A series of techniques carefully selected to include physical movements aimed at strengthening a person without any external help to restore lost or nearly lost capabilities

● Psychological support: Giving of counseling, psychotherapy, and medication if needed [8].

● Changing lifestyle habits: It could be a balanced diet, observing good sleep patterns, managing stress, and not overworking.

● Follow-up: Regular medical examinations every three months prior to the diagnosis and during the recovery phase to monitor the patient's condition and reduce the risk of complications. Doctors should offer patient-focused services, acknowledge the symptoms experienced by the patient, and their effect on the patient's daily activities [3]

Despite the knowledge that has been gathered, it is still a major problem to face the challenges that come with the management of people with post-COVID syndrome. Lack of widely acknowledged diagnostic tools for post-COVID syndrome.

The symptoms of the diseases change most of the time, and they may also match a set of problems that fall under other non-COVID-related conditions. Besides, there is an insufficient number of provision of health centers conducting multiple-field rehabilitation. The heavy load on the part of the patient due to the uncertainty and fright that have been caused by the current state of recovery [5].

Solving present challenges, creating strong professional-stakeholder cooperation bridges, enlightening, and sponsoring the next research on the long-term effects of the disease through the use of the educational method are just some of the advantages of planning, surveying, normalizing, and walking through various paths. Telemedicine and digital health solutions will be very helpful in frequently updating and attending to patients' needs, which will not only be the case in the future.

Post-COVID syndrome represents a complicated, multi-system issue that needs attentive, coordinated care. The family doctors who are on the frontline provide through assessment, individualized management, and long-term support. Early identification, patient education, and multidisciplinary care integration are fundamental in getting better results. R&D are essential facets that will, consequently, facilitate/supplement new practices, as well as those that have been verified to be the best primary healthcare settings ones.

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WAVELET-ORIENTED RECONSTRUCTION AND RIDGE DETECTION IN REMOTE PHOTOPLETYSMOGRAPHY (RPPG) SIGNALS FOR ASSESSMENT OF THE STATE OF THE CARDIOVASCULAR SYSTEM

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Abstract. An approach to the reconstruction and analysis of remote photoplethysmographic (rPPG) signals based on wavelet transform is developed to detect characteristic morphological features, such as systolic and onset peaks. The proposed method combines discrete wavelet transform (DWT) for morphology reconstruction and continuous wavelet transform (CWT) for time-frequency analysis. A ridge detection algorithm based on tracking bifurcations in the scalogram is implemented, which allows determining dominant oscillatory structures (rPPG signal morphology for cardiovascular system assessment). The obtained results confirm the effectiveness of the approach, which is 96.3 %, for increasing the reliability of non-contact monitoring of cardiovascular activity.

Introduction. Remote photoplethysmography (rPPG) provides non-contact measurement of cardiovascular parameters by analyzing subtle changes in skin color, which reflect fluctuations in blood volume. However, rPPG signals are often distorted by motion artifacts, lighting changes, and sensor noise, which makes it difficult to extract morphological characteristics of the pulse wave. Wavelet analysis is an effective tool for analyzing non-stationary biomedical signals, as it allows you to localize the features of the signal morphology simultaneously in time and frequency [1]. The study used a combination of discrete wavelet transform (DWT) for noise suppression and morphology restoration and continuous wavelet transform (CWT) for detailed analysis of the signal structure and detection of its dominant frequency components.