

National Guideline in the Post-COVID-19 Clinical Care

Ministry of Health
Saudi Arabia
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- Epidemiology
- Prevalence
- Risk factors, and Risky groups for Post-COVID conditions
- Timing of resolutions of symptoms
- COVID_19 variants
- Pathophysiology
- The onset patterns of the post-COVID conditions
- Symptoms
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References

Abbreviations

- ✓ National Institute for Health and Care Excellence (NICE),
- ✓ The Scottish Intercollegiate Guidelines Network (SIGN) guideline
- ✓ The Royal College of General Practitioners (RCGP)
- ✓ Acute coronavirus disease 2019 (COVID-19)
- ✓ Post-intensive care syndrome (PICS)
- ✓ International Classification of Diseases, Tenth Edition Clinical Modification (ICD-10-CM).
- ✓ Patient population, intervention, comparison, outcome, and setting (PICOTS)
- ✓ limitations in activities of daily living (ADLs)
- ✓ Post-COVID-19 Functional Status (PCFS) scale
- ✓ cardiovascular magnetic resonance (CMR)
- ✓ Angiotensin-converting enzyme 2 (ACE2)
- ✓ Venous thromboembolism (VTE)
- ✓ Acute respiratory distress syndrome (ARDS)
- ✓ Computed tomography (CT)
- ✓ C-reactive protein (CRP)
- ✓ Brain natriuretic peptide (BNP)
- ✓ Intensive care unit (ICU)
- ✓ Post-traumatic stress disorder (PTSD)
- ✓ General Anxiety Disorder-7 (GAD-7)
- ✓ Patient Health Questionnaire-9 (PHQ-9)
- ✓ PTSD Symptom Scale (PSS)
- ✓ Screen for Posttraumatic Stress Symptoms (SPTSS)
- ✓ PTSD Checklist for DSM-5 (PCL-5)
- ✓ Impact of Event Scale-Revised (IESR)
- ✓ Hospital Anxiety and Depression Scale (HADS)
- ✓ Variant of high consequence (VOHC)
- ✓ Montreal Cognitive Assessment (MoCA)
- ✓ •Mini Mental Status Examination (MMSE)

Introduction

Scope of the guideline:

This guideline addresses the following areas related to the post -:

- Describe the symptoms and conditions associated with post-COVID conditions .
- Explore the standard clinical assessments and tests, required to reduce the burden from excessive testing and medical encounters.
- Describe the role of virtual Hospital in the management of Post-COVID-19 clinical care
- Describe the medical home approach and how it can be used to optimize patient care.
- **If you are healthcare provider, please direct your questions to 937**

Aim of the guideline:

This Guideline aims to provide health care professionals with an updated knowledge, skills and tools to effectively diagnose and manage of the Post- Covid-19 cases in Kingdom Saudi Arabia. Based on current evidence for best practices that is suitable for our target population, culture, health-care system, and resources.

Target audience of the guideline:

This guideline is intended for the use of healthcare professionals at Primary and Secondary Health Care Settings and targeted health professionals of the following specialties including Physicians; Psychologists; Physiotherapists; Public Health Workers; Laboratory technicians and nurses

Clinical questions to be answered:

The following six items (PICOS) (patient population, intervention, comparison, outcome, and setting) were used to define and cover different aspects:

(P) The target Population concerned and characteristic of disease condition:

This guidance refers to patients who meet the clinical case definition of ongoing symptomatic COVID-19 and post-COVID-19 syndrome includes inhabitants in KSA, Saudi and non-Saudi, both sex and all age groups whom infected with Covid-19 for more than four weeks

(I) the Interventions:

- Screening, diagnose, assess the population for long Covid-19 cases
- Management (Supportive, psychological, dietary and physical exercise interventions. Through Virtual assessment, and Primary Health Care Centers.
- Referral to secondary and tertiary care for further assessment and management.

(C) Comparison:

- The best measurement tool
- The appropriate interventions and management plans

(O) The expected Outcome including patients, public and system:

- To reduce the expenditure on the health system.
- To decrease clinical practice variation. As fragmented care, increase the risk of contradictory medical advice.
- To prepare a national guideline in the management of Pos-COVID19 cases
- To improve the overall health status outcome among COVID-19 cases
- To reduce the burden (e.g., financial, time, and psychological burden)

(S) The Health Care Setting and context in which the guidelines are to be implemented

The structure of the guideline

- 1) Chapter one; Post-COVID-19
- 2) Chapter two; Post COVID-19 clinical care service in KSA
- 3) Chapter three; The holistic post-COVID assessment
- 4) Chapter Four; The management plans
- 5) Chapter five; Post-COVID-19 A specific section on children and young people
- 6) Chapter Six; Appendix

Supporting Evidence;

- ❖ Long-COVID-19 (Post-COVID-19 syndrome. International SOS, 19March 2021.
- ❖ National guidance for post-COVID syndrome assessment clinics. Report template - NHSI website (england.nhs.uk). Version 2, 26 April 2021s: The National Institute for Health and Care Excellence (NICE),
- ❖ Evidence summary has been updated in line with NICE/SIGN/RCGP guidance
- ❖ The Scottish Intercollegiate Guidelines Network (SIGN) guideline
- ❖ The Royal College of General Practitioners (RCGP) Primary Health Care centers and Hospitals
- ❖ Trisha Greenhalgh and Matthew Knight (2020). Long COVID: A Primer for Family Physicians. American Family Physician website at www.aafp.org/afp. Copyright © 2020 American Academy of Family Physicians. For the private, noncommercial use of one individual user of the website. All other rights reserved

Development Process:

- Reviewed the Post-Covid-19 Clinical Practice care published literatures and Guideline for providing effective Post-Covid-19 Clinical care in Saudi Arabia
- Conducted a rigorous review of relevant evidenced based scientific literature. After a thorough assessment, a consensus was reached to avoid duplication of efforts and to fill the gap
- The updated version was presented in a workshop, involving the Scientific Committee, in addition to other relevant stakeholders and the recommendation of the participants were included.
- We retrieved 53 articles to screen articles, titled as long covid-19 were read by authors first, and followed by abstracts to further narrow down the number of records considered. To avoid unnecessary exclusion of studies, limited exclusion and inclusion criteria were applied. We excluded papers that were not relevant to or not mention long covid-19
- The final draft of the first edition was distributed to be reviewed by the Scientific Committee and their comments were included (members of the team were listed at appendix I

Chapter 1;

Clinical case definition of post COVID syndrome

- Called
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- Prevalence
- Risk factors, and Risky groups for Post-COVID conditions
- Timing of resolutions of symptoms
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Clinical case definition of post COVID syndrome⁽¹⁻¹⁰⁾

Called: Long-COVID”, or “Post-COVID-19 syndrome”, or “chronic COVID syndrome”, or “late sequelae of COVID-19”, or “long haul COVID”, or “long-term COVID-19”, or “post-acute COVID-19”, or “post-acute sequelae of SARS-CoV-2 infection, or “COVID long-haulers”

Definition: this persistent state of ill health is However, there is no internationally agreed definition of post COVID condition as of yet”

This set out the following clinical definitions:

- 1. Acute COVID-19:** signs and symptoms of COVID-19 for up to four weeks.
- 2. Ongoing symptomatic COVID-19:** signs and symptoms of COVID-19 from 4 to 12 weeks. The patient should offer the following:
 - Signposted to self-management including the online platform Your COVID-19 Recovery (YCR) Phase 1.
 - Supported self-management which may include support from the practice or primary care network team and linking into community groups

3. *Post-COVID-19 syndrome*:

Is a spectrum of signs and symptoms that persist for or develop after 12 weeks following an acute COVID-19 infection and are not explained by an alternative diagnosis, which should be assessed and excluded?

4- **The term ‘Long COVID’;** is used to describe signs and symptoms that continue or develop after acute COVID-19. It includes both ongoing symptomatic COVID-19 and post-COVID-19 syndrome. Due to a dysfunctional immune-inflammatory response, that affects people who were never hospitalized and may occur without a history of a polymerase chain reaction test positive results

This term was coined by online communities of patients who felt dismissed by their physicians as overreacting to “mild” illness. However, evidence concluded that it is a distinct syndrome,

Rational:

From more than 4,000 international studies, worldwide, prolonged COVID-19 symptoms were reported one in 2 adults and around 2% of children. More over the persistence of Long COVID symptoms for months could be emerging as a chronic disease

Epidemiology:

It is difficult to predict accurately the number of infected COVID-19 cases who will progress to long COVID-19 or the complicated long COVID-19 because the incidence and mortality rates of covid-19 vary between countries. The disparity is likely the result of differences in the accuracy of diagnosis, base population, capability of healthcare systems, and the reporting systems.

Prevalence:

The disparities between long COVID epidemiology reports are owing to many reasons, including the population assessed. Length of follow-up period, symptoms examined, and accuracy of self-reporting. In addition, the reported incidence of Post Covid-19 of from studies around these finding is not fully corroborative, but show that a substantial proportion of people develop long COVID-19 after covid-19 may

- Around 33% of cases had not returned to their usual state of health when interviewed 3 to 6 weeks after diagnosis
- 32.6% to 87% at 60 days (2months)
- 96% at 90 days (3months)
- 76% of people at 6 months
- 30% of patients still had persistent symptoms at 9 months. The majority of patients surveyed (85%) were outpatients with mild illness
- ICU admitted patients may experience post-intensive care syndrome (PICS) which are health problems that remain after critical illness
- The UK Office for National Statistics (ONS) has released data on the prevalence of long COVID symptoms. Estimates that 22% at 5 weeks / 9.9% at 3 month / around 1 in 10 of participants may had symptoms for 3month or longer.

Risk factors, and Risky groups for Post-COVID conditions : (14- 20)

- Women; with unknown biological risk factors and unclear demographic differences
- Children and adolescents as well as adults; with unknown true frequency and severity
- Anyone infected with (even who suffered mild illness) risky to develop Long-COVID
- People with weak immune responses to the infection
- Those who suffered from severe COVID-19 disease
- Comorbidities; among more than 1/3 of patient's experiences long COVID-19; the most common co-morbidities were diabetes mellitus and hypertension.
- Older patients; higher risk for severe acute disease and related ongoing symptoms.
- Even younger healthy patient's months after the onset of acute infection reported debilitating post-COVID conditions
- Other Factors nonspecific to COVID-19, at baseline of infection or prolonged acute infection for example; and mental physical health consequences of a potentially life-threatening conditions
- Pre-COVID -19 comorbidities (underlying medical conditions).

Timing:

Resolution of symptoms these have been after recovery from acute illness that last weeks or even months

No hospitalized COVID-19 patients; after symptom onset

- Two-thirds are symptom-free by 14 days
- Ninety Percentage are symptom free by 21 days
- The rest of patients experience persistent—or relapsing and remitting—symptoms, including cough, breathlessness, fatigue, fever, sore throat, nonspecific chest pains (lung burn), cognitive blunting (brain fog), anxiety, depression, skin rashes, and diarrhea.

COVID-19 variants of concern ^(21, 22)

Several covid-19 variants as in Table 1; have emerged that have an increased transmissibility and may result in more severe acute disease 30 June 2021, These viral strains can inflict long term complications needs to be examined fully.as one variant causes more damaging long term effects than others patients infected with such a variant w develop longCOVID-19 symptoms may require additional support, as well as more rapid and intense treatment strategies to combat their long term symptoms.

Names	Effect	Vaccine efficacy (two doses)
Wild type SARS-CoV-2		
1 ST strain is "Kent variant" from the B.1.1.7 lineage, now termed the Alpha variant.	Approximately 40-50% increased transmissibility than original and likely increases acute disease severity	Oxford AstraZeneca are, 74.5%. BioNTech vaccine are 93.7%. Novavax are 85.6%. Moderna are 100%. Sinovac vaccine are 71-91%
Beta, 1 st discovered May 2020	with a 50% increase in transmission,	Both Pfizer and Moderna vaccines are still 95% .Novavax (60%) and Johnson and Johnson (57%). Oxford-AstraZeneca single dosed vaccine show low efficacy against beta 82% effectiveness in preventing severe disease and death. Sputnik V's was 70% lower against beta than against wild type.
The Gamma, in Manaus, Brazil, in November 2020	1.7-2.4 times more transmissible than wild-type SARS-CoV-2.	Pfizer vaccine, effective in 60% of the fully vaccinated people. while Sputnik V is "highly effective" against gamma variants
Delta, identified 1 st in October 2020.is the dominant in Europe , and US (9 mutations on the spike protein)	The most transmissible form 60% more so than the alpha variant,	67% with the Oxford-AstraZeneca vaccine and 88% with the Pfizer-BioNTech vaccine, while Sputnik V is 90% effective.
Eta, Zeta, Theta, Lambda, and Kappa variants	Under investigation	
New Omicron (or B.1.1.529) variant (32-50 mutations on his protein)	It is not yet clear whether infection with Omicron causes more severe disease compared to infections with other variants, including Delta	
Deltacron COVID-19 variant (1 st discovered January 9, 2022).	.10 of the mutations from Omicron have been found in the new variant	
New variants of the SARS-CoV-2 virus are detected every week		

N.B; Nowadays, no SARS-CoV-2 variants are considered Variant of high consequence (VOHC)

- Covid-19 caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), enters cells via the angiotensin-converting enzyme 2 (ACE2) receptor (which present in numerous cell type including in the oral and nasal mucosa, lungs, heart, gastrointestinal tract, liver, kidneys, spleen, brain, and arterial and venous endothelial cells,).
- The virus once internalized, undergoes replication and maturation, then provoking an inflammatory response through activating and infiltrating the immune cells by various cytokines. This highlighting how SARS-CoV-2 causes multiple organs damage. long COVID-19 exhibit involvement and impairment in the structure and function of multiple organs

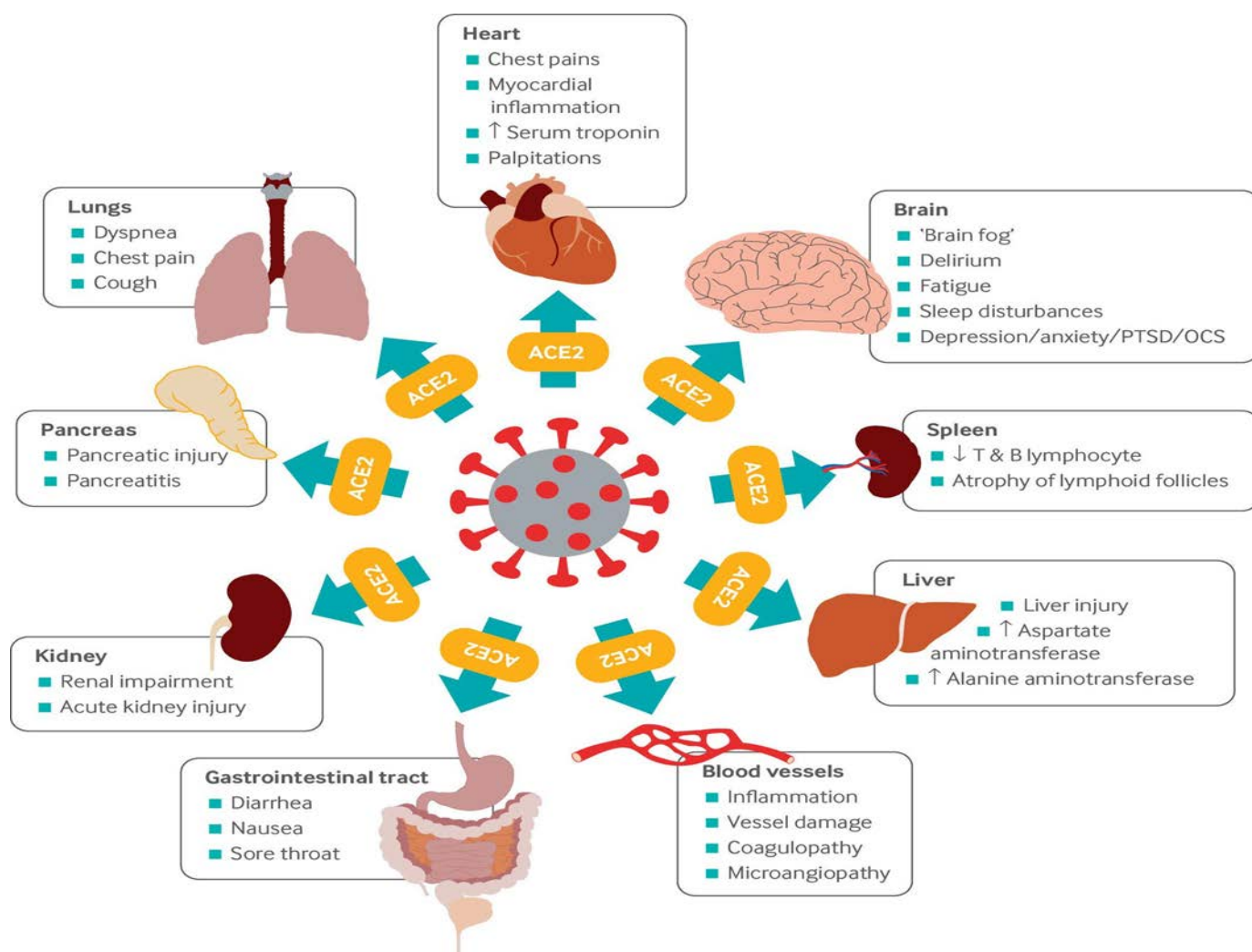


Fig (2) The SARS-CoV-2 virus gains entry into the cells of multiple organs via the ACE2 receptor. Once these cells have been invaded, the virus can cause a multiple of damage ultimately leading to numerous persistent symptoms, some of which are outlined here.

The onset patterns of the post-COVID conditions^(23, 24)

- a. *Persistent conditions, and /or symptoms*, that start at the onset of acute infection
- b. *New-onset and late sequelae; that starts* following the asymptomatic COVID-19 disease or a following the relief period of acute symptom relief or remission;
- c. *Evolution of symptoms and conditions*; that composed of some new added symptoms over time (e.g. memory loss), in addition to the persistent of some symptoms (e.g., dyspnea)

Wide range of clusters of symptoms present in Long-COVID either⁽²⁰⁾:

- In isolation or several of them together (often overlapping)
- May be transient, constant or may change with time.
- Which can fluctuate and change over time
- Can affect any system in the body.

Post-COVID-19 associated with functional limitations, beside the wide a spectrum of many consequences (psychological, physical, and social) that affect the patient wellness and quality of life. Based on the current Evidence on the PASC the observed multi-organ clinical sequelae was summarized in (Figure 3 and Table2)

Fig (3) Long-term effects of COVID-19

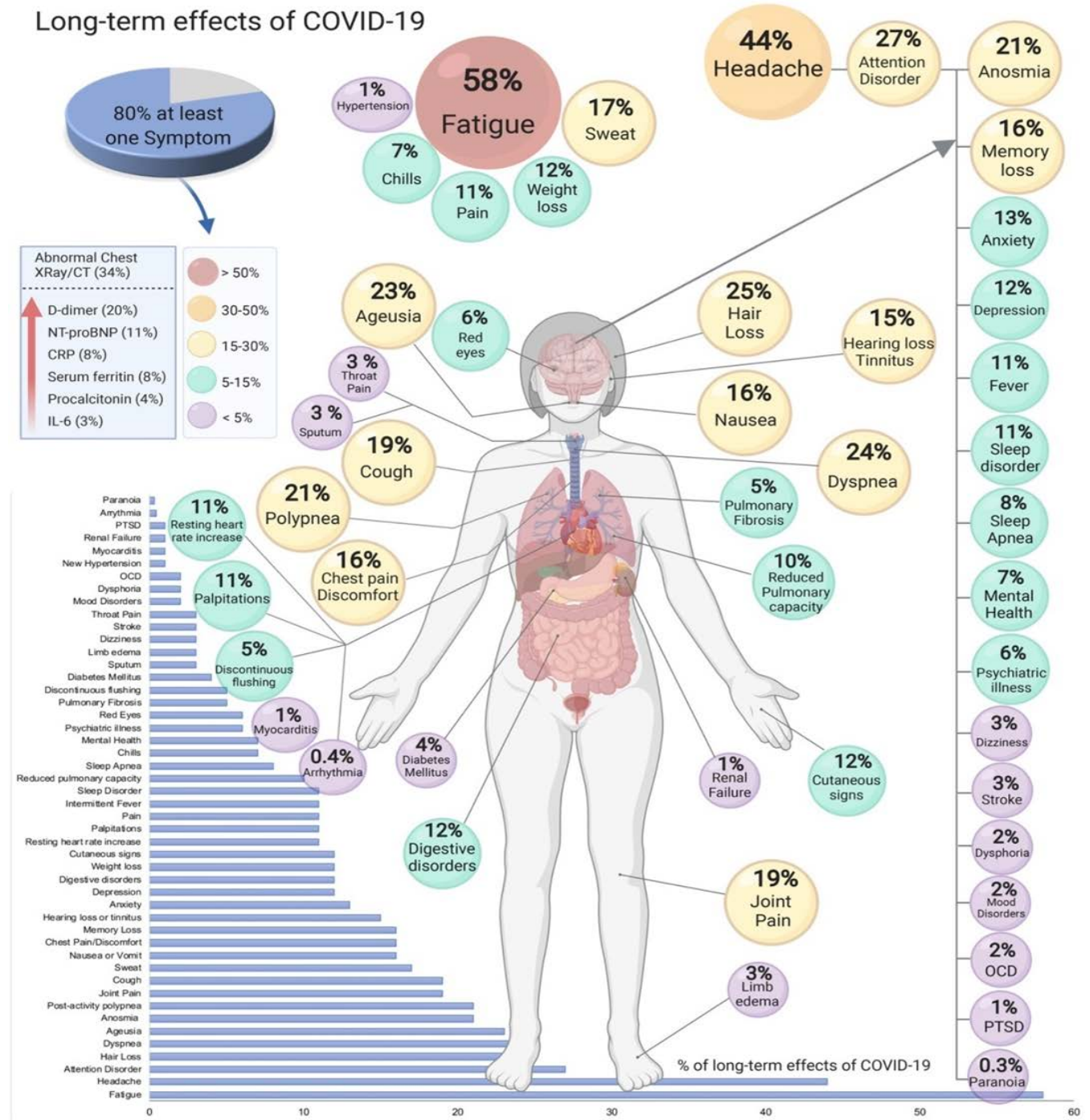


Table 2 summarizes these multi-organ clinical sequelae of COVID-19. (28,29)

Organ Systems	Clinical Manifestations	Pathological features	Potential Underlying Biology
Respiratory system	<ul style="list-style-type: none"> Chronic cough Shortness of breath (dyspnea), breathlessness Chest pain Reduced exercise capacity Acute respiratory diseases Fibrotic lung disease Bronchiectasis Pulmonary vascular disease 	<ul style="list-style-type: none"> Congestive lungs with alveolitis Ground glass opacities Pulmonary lesions Mononuclear inflammatory cell (Monocyte and macrophage) and fibrinous exudate Inflammatory edema in respiratory mucosa and alveolar wall Platelet-fibrin thrombi Necrotising bronchiolitis, diffuse alveolar damage (DAD), hyaline membrane formation 	<ul style="list-style-type: none"> Direct viral invasion via ACE-2 expression in the upper airway (goblet and ciliated epithelial cells), lower respiratory tract epithelium (type II alveolar), and pulmonary vasculature (arterial smooth muscle), and endothelial cells Residual virus in lungs post recovery Cytokine storm Activation of the complement system Microthrombi and macrothrombi formation
Cardiovascular system	<ul style="list-style-type: none"> Chest pain Palpitations Ventricular dysfunction Myocardial injury Myocarditis Cardiomyopathy Cardiac arrhythmias Myocardial ischemia Thromboembolism 	<ul style="list-style-type: none"> Cardiac Increased troponin levels Low-grade myocardial inflammation Hypertrophied cardiomyocytes with inflammatory infiltrates Focal edema Interstitial hyperplasia Fibrosis Degeneration, necrosis and signs of lymphocytic myocarditis Hematologic Edematous changes in alveolar capillaries Fibrin thrombi Perivascular inflammatory infiltrates Brain lesions Hyperemia, edema and neuronal degeneration Demyelination Acute hypoxic ischemic injury 	<ul style="list-style-type: none"> Direct viral invasion via ACE-2 receptor in cardiac tissue (pericytes, endothelial cells, cardiomyocytes, cardiofibroblasts, and epicardial adipose cells, and vascular cells) Cytokine storm Hyperinflammation Endothelial dysfunction Leucocyte infiltration Formation of microvascular thrombosis
Nervous system	<ul style="list-style-type: none"> Fatigue Myalgia Anxiety Depression PTSD Sleep disorders Headaches Taste and smell impairment (ageusia and anosmia) Cognitive impairment (brain fog) Mood swings Seizures Ischemic or hemorrhagic stroke Encephalitis 	<ul style="list-style-type: none"> Diffuse proximal tubule injury Protein exudate in balloon cavity and thrombus in capillaries Non-specific fibrosis with lymphocytic infiltrates Acute tubular necrosis 	<ul style="list-style-type: none"> Proposed SARS-COV-2 viral invasion by breaching blood-brain barrier or through olfactory nerves Hypoxia Cytokine storm Hyperinflammation Coagulation abnormalities Endothelial dysfunction
Urinary system/ Kidney	<ul style="list-style-type: none"> Acute kidney injury Albuminuria Proteinuria Hematuria 	<ul style="list-style-type: none"> Diffuse proximal tubule injury Protein exudate in balloon cavity and thrombus in capillaries Non-specific fibrosis with lymphocytic infiltrates Acute tubular necrosis 	<ul style="list-style-type: none"> Direct viral invasion via positive ACE-2 expression in kidney tissue (proximal tubule epithelial cells, glomerular endothelial cells, podocytes and kidney vasculature) Cytokine storm Systemic hypoxia Activation of complement components (C5b-9) Abnormal coagulation
Digestive system/Liver	<ul style="list-style-type: none"> Acute liver injury Cholestasis Elevated serum liver biomarkers (aspartate aminotransferase (AST), alanine aminotransferase (ALT), bilirubin) 	<ul style="list-style-type: none"> Hepatic cell degeneration Multi-focal necrosis, indicative of cirrhosis Biliary plugs in the small bile duct Atypical lymphocytic infiltration in the portal tract Increased number of portal veins Activated Kupffer cells Smooth muscle fragmentation of portal vein Stenosis of small intestine Segmental dilatation Degeneration, necrosis and shedding in the gastrointestinal mucosa Inflammatory infiltrates 	<ul style="list-style-type: none"> Direct viral invasion via ACE-2 expression in the hepatobiliary system (cholangiocytes, hepatocytes and bile duct cells) Systemic inflammation Hypoxia Drug-induced damage Coagulation abnormalities Direct viral invasion via ACE-2 expression in digestive tract (small intestinal enterocytes) Alteration of intestinal microbial flora Cytokine storm
Digestive system/ Gastrointestinal tract	<ul style="list-style-type: none"> Diarrhea Decreased appetite Nausea/Vomiting Abdominal pain Gastrointestinal bleeding Anorexia 	<ul style="list-style-type: none"> Stenosis of small intestine Segmental dilatation Degeneration, necrosis and shedding in the gastrointestinal mucosa Inflammatory infiltrates 	<ul style="list-style-type: none"> Direct viral invasion via ACE-2 expression in digestive tract (small intestinal enterocytes) Alteration of intestinal microbial flora Cytokine storm
Reproductive system/Testis	<ul style="list-style-type: none"> Orchitis Infertility Sterility 	<ul style="list-style-type: none"> Leucocyte infiltration Edematous testicular cells Destruction of the seminiferous tubules 	<ul style="list-style-type: none"> Direct viral invasion via positive ACE-2 and TMPRSS2 expression in testicular cells Hyperinflammation
Dermatological system/Skin	<ul style="list-style-type: none"> Hair loss Erythematous rash Dermatitis Pseudo-chilblains on fingertips and toes Urticaria Chicken pox-like vesicles* 	<ul style="list-style-type: none"> Reduced spermatogenesis Vasculitis Dermatological lesions in trunk, hands and feet Perivascular inflammatory infiltrates in the superficial dermis with extravasation of red blood cells and intraluminal thrombi Capillary thrombosis with diffuse hemorrhage Parakeratosis, acanthosis, dyskeratotic keratinocytes, necrotic keratinocytes, acantholytic clefts along with lymphocytes satellitisms 	<ul style="list-style-type: none"> Direct viral invasion via positive ACE-2 expression in endothelium, stratum basale, sebaceous and eccrine cells

The symptoms of Long-COVID-19 (30-36)

Most commonly reported symptoms are fatigue and breathlessness. Other complaints are mentioned below but may not be limited to

1. **General symptoms;** fatigue, vitamin D deficiency, weight loss, dysautonomia, allergies and mast cell activation syndrome, progression of comorbid conditions reactivation of other viruses and, pain syndromes,
2. **Limitations in activities of daily living (ADLs)** such as walking, bathing, or dressing and musculoskeletal joint pain, muscle pain, fever.
3. **Pulmonary Impairments;** interstitial lung disease, dyspnea, and reactive airway disease
4. **Cardiovascular system Impairments;** chest pain, palpitations (loud or fast heart beats), chest tightness, Myocarditis, heart failure, pericarditis, orthostatic intolerance (e.g., postural orthostatic tachycardia syndrome (POTS)
5. **Neurological Impairments;** Inability to focus or concentrate (brain fog), memory issues, headache, olfactory and gustatory dysfunction, sleep difficulties, numbness, tingling sensation, and transient ischemic attack/stroke.
6. **Gastrointestinal, and Hepatic Impairments;** pain in abdomen, diarrhea, nausea, loss of appetite
7. **Urology, and Kidney Impairments;** Incontinence, chronic kidney disease, and sexual dysfunction
8. **Mental Health Mood swings,** anxiety, depression, post-traumatic stress disorder (PTSD), and psychosis
9. **Metabolic, and endocrine Impairments;** diabetes mellitus, hypothyroidism
10. **Ear, Nose, and Throat;** Loss of smell and taste, earache, sore throat
11. **Skin;** rashes, alopecia
12. **Hematology;** pulmonary embolism, arterial thrombosis, venous thromboembolism, or other hypercoagulability

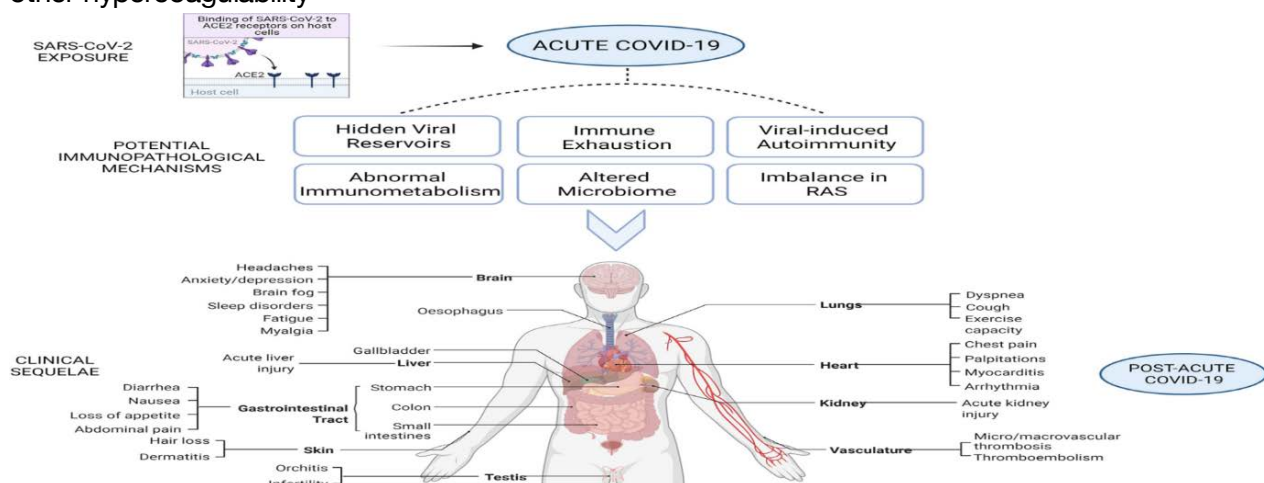


Figure 3, Potential immune-pathological mechanism underlying multi-organ sequelae of post-acute sequelae of COVID-19 (PASC).

Sequelae and Subtypes of long COVID-19 ^(20, 25)

COVID-19 sequelae subtype criteria*, COVID-19 Clinic of the University of Cincinnati Medical Center.

	Type 1	Type 2	Type 3		Type 4		Type 5
Initial symptoms	Variable ^a	Mild	A	B	A	B	None
			Mild	Mild	None	None	
Duration of symptoms	Variable ^a	>6weeks	3-6 months	>6 months	Variable	Variable	N/A
Period of quiescence	No	No	Yes	Yes	No	No	N/A
Delayed onset of symptoms	No	No	No		Yes	Yes	Yes
					≥3 months	≥6 months	

^aCorrelate with the severity of initial infection, number of organ system injured and pre-existing medical conditions.

Prognosis of Long-COVID-19⁽²⁰⁾

Despite the scarce amount of published reports, or studies, that indicate that the majority of PCS patients had good prognosis with no reported fatal complications or outcomes, further studies are still required

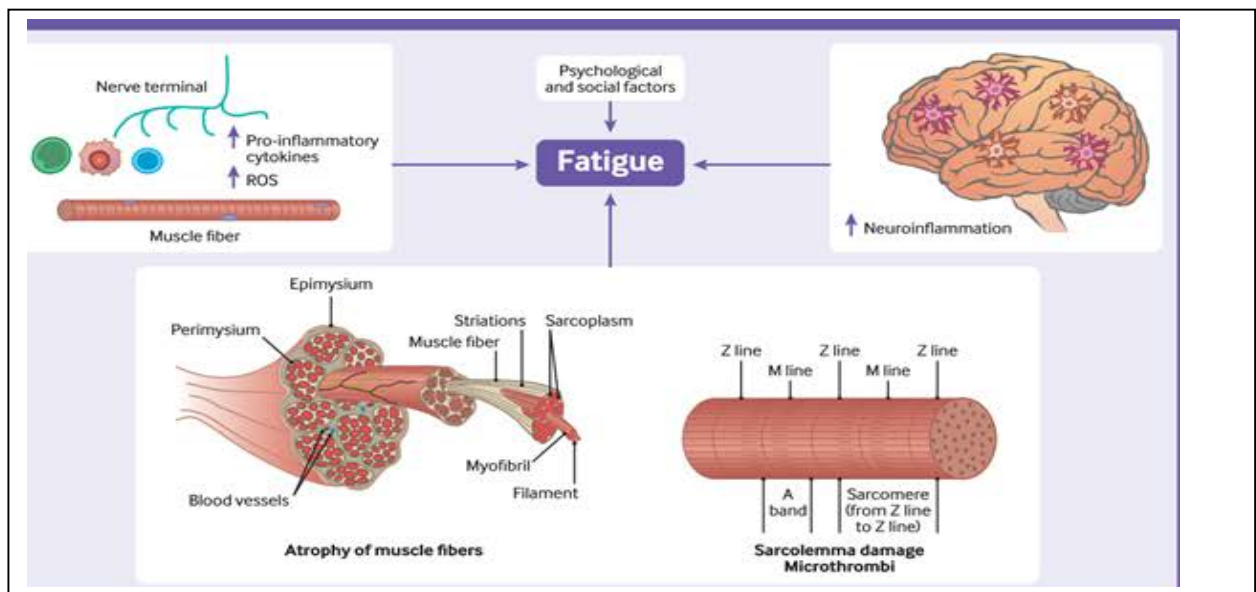
1) Fatigue ⁽³⁶⁻⁴⁸⁾

Estimated prevalence in long COVID-19

Fatigue is a major manifestation, and a common persisting symptom regardless of severity of the acute illness. It is more profound than being overtired.

- Incidence starting from 11.9% at the five week
- To 93.5% and 92.9% of hospitalized and non-hospitalized patients, respectively, reported ongoing fatigue at 79 days (3-4 m) following onset of illness
- To 60.3 and 98 0% in wards and ICU respectively
- 58%. up to 60% of cases reported ongoing fatigue at 12 months following recovery from the acute illness
- Fatigue can be reported up to 7 months after the onset of acute COVID-19

Fig 4: Pathophysiology of post-COVID-19 fatigue



Definition;

It is unrelenting exhaustion and a constant state of weariness that causing manifest disability through reducing a person's energy, motivation, concentration. When continue beyond seven months requiring complete assessment and investigations.

Risk factors;

Fatigue has been significantly higher among male gender and COVID-19 patients with comorbidities e.g., diabetes mellitus, and hypertension.

After COVID-19 infection, chronic fatigue results from inflammatory response pathways miscommunication, systemic inflammation and cell mediated immune mechanisms, rather than direct viral neuro-invasion with no association between pro-inflammatory markers and long term fatigue in patients with persisting fatigue.

The development of post-covid-19 fatigue, is likely to be due to a range of central, peripheral, psychological factors, and other factors

- **Negative psychological and social factors** associated with the covid-19 pandemic have also been linked to chronic fatigue
- **Other factors** include immune system dysfunction, hormonal disturbances, , , nervous system abnormalities and infection
- **Peripheral factors** such as direct SARS-CoV-2 infection of skeletal muscle, resulting in damage, weakness, and inflammation to muscle fibers and neuromuscular junctions may contribute to fatigue.
- **Central factors;**
 - Frontal lobe and cerebellum hypo metabolism in the central nervous system (CNS),
 - Lymphatic system congestion and the subsequent toxic build-up caused by an increased resistance to cerebrospinal fluid drainage through the cribriform plate as a result of olfactory neuron damage.

Diagnosis

Currently, there is no generally accepted method. It mainly diagnosed by excluding any diseases that had similar symptoms. The presentations;

	Post-COVID-19 fatigue	Myalgia encephalomyelitis (ME)	Chronic fatigue syndrome (CFS)
Overlap symptoms	Include fatigue, neurological/pain, cognitive dysfunction (neurocognitive)/psychiatric, neuroendocrine, autonomic, and immune symptoms, prolonged relapse of exhaustion, long symptom durations, reduced daily activity, depression, and post-exertional malaise.		
The difference		ME/CFS remains enigmatic	

Therefore, research into long COVID-19 may assist in developing understanding of ME/CFS and vice versa.

Extreme fatigue and incapability to perform daily life activities is a common complaint among COVID-19 survivors. They share features with chronic fatigue syndrome (CFS) encountered after SARS, MERS, and community-acquired pneumonia.

Post-exertional malaise; is a term used to describe the worsening of symptoms 12 to 48 hours after any mental or physical or exertion even minor ones and lasting for days or even weeks). These patients may need modifications in the testing plan

2) Musculoskeletal symptoms and limitations in ADLs:⁽⁴⁹⁻⁵²⁾

Presenting as

- Limitations in ADLs (dressing, walking, bathing, or with multi-factorial causes of this functional decline
- Patients with post-COVID conditions may share the symptoms that occur in patients who had (fibromyalgia, post-treatment Lyme disease syndrome, dysautonomia external, and mast cell activation syndrome symptom management approaches that have been helpful for these disorders

Mechanism

Physical weakness may be due to:

- Direct effect of myopathy, neuropathy, cardio-respiratory impairments, cognitive impairment.
- Combination of the above mentioned conditions.
- The multiple diverse symptoms that affects different parts of the body as part of COVID-19 long-haulers such as nausea, extreme fatigue, dyspnea or shortness of breath, cough, chest pain, brain fog, Short-term memory loss, palpitations, excessive bruising, joint pain, light and sound sensitivity, coagulation, neurological, gastrointestinal and gynecological problems.

Diagnosis

- Post-COVID-19 Functional Status (PCFS) scale; to track the full spectrum of functional outcomes over time
- The 10-minute NASA Lean Test (NLT) is a simple and clinically useful point-of-care method for early diagnosis of PASC, and help guide the management and treatment of orthostatic intolerance.
- A comprehensive assessment of five parameters: ADLs, respiratory function, physical function, cognitive function and quality of life is recommended to assess the functional limitations post-COVID-19 ⁽¹⁸⁾.
- Provocation studies with cognitive, postural and physical challenges to clarify the biological abnormalities that causally connected to the post-COVID symptoms.

Management

- The Stanford Hall consensus statement for post-COVID-19 rehabilitation has recognized and classified the requirements of multidisciplinary rehabilitation approach: to ensure the care continuum, and to achieve a gradual but complete recovery into the following domains; pulmonary, cardiac, sport and exercise medicine (SEM), psychological, musculoskeletal, neuro- rehabilitation and general medical.
- Innovative approaches including virtual rehabilitation programs (such as video-linked and online classes, home education booklets, and telephonic support) are likely to become the norm ahead.

3) Pulmonary, and respiratory Impairments⁽⁵³⁻⁶²⁾

Estimated prevalence

a) Of dyspnea;

- Estimated in of 4.6% at 5 weeks post-covid-19 infection, regardless of presence of acute respiratory symptoms or disease severity.
- 43.4% of 143 patients assessed were still experiencing dyspnea 2m after covid-19 onset.
- Breathlessness is common in people with long COVID-19.

b) Of respiratory complications;

COVID-19 is a respiratory illness, and Respiratory complications are not unusual

- *Roughly a third of the survivors* had identified long-term lung damage and lung functional abnormalities
- *After three months of onset of infection;* 35 (64%) showed persistent symptoms, and 39 (71%) of them showed different degrees of radiological and physiological lung abnormalities
- *Of discharged, and asymptomatic cases;* 94% Residual lung computed tomography (CT) abnormalities with predominantly ground-glass opacity
- *30 days after hospital discharge (in the early convalescence phase);* 50% showed decreased lung diffusing-capacity, lower respiratory muscle strength, and lung imaging abnormalities

Definitions

Dyspnea; Shortness of breath

Risky groups including

- Older people, those who endure acute respiratory distress syndrome,
- Those who have extended hospital stays,
- Those with pre-existing lung abnormalities are prone to develop fibrotic-like changes to lung tissue.

Fig 5 ; Pathophysiology of post-COVID-19 Pulmonary , and respiratory Impairments



Diagnosis; Abnormalities in;

- The total lung capacity.
- Diffusion capacity for carbon monoxide
- Forced expiratory volume in the first second,
- Forced vital capacity.
- Small airway function.
- In certain conditions, Post-covid-19 long-term breathing difficulties have no signs of permanent lung damage.

N.B; in hospitalized covid-19 patients at time of discharge and one month after onset of symptoms.

Mechanisms

- SARS-CoV-2 replicates in the endothelial cells, causes substantial lung and respiratory tract damage and an intense immune and inflammatory reaction.
- SARS-CoV-2 direct invade via ACE2 expression in the upper airway (goblet and ciliated epithelial cells), pulmonary vasculature (arterial smooth muscle), lower respiratory tract epithelium (type II alveolar), and endothelial cells this immunological damage leads to the development of acute respiratory distress syndrome (ARDS) and subsequent long-term respiratory impairment
- After three negative nasopharyngeal swab samples, Pathological evidence shows that the virus or its particles persist in the lung.
- After recovery, the COVID-19 associated; atypical pneumonia and (ARDS) cause irreversible fibrosis and scarring. The varying degree of pulmonary histopathological changes and functional pulmonary abnormalities that leads to lasting lung alveoli damage, long-term breathing problems that supports the manifestation of chronic lung tissue damage

- After the resolution of infection, in some patients accelerated, lung fibrosis triggered by elevated levels of pro-inflammatory cytokines, in particular IL-6 and TGF- β , may contribute to the long-term respiratory sequelae.
- Pulmonary vascular thromboembolisms increase that may contribute to the long-term respiratory sequelae.

^{N.B} Despite these abnormalities in imaging and functional parameters, the long-term clinical significance of these findings needs further elucidation.

4) Cardiovascular Impairments ^(14, 26, 63-67)

Estimated prevalence

The COVID-19 patients who had recently recovered from the illness;

- 78%, showed abnormal cardiovascular magnetic resonance (CMR) findings
- 60% had ongoing myocardial inflammation
- Among recovered athletics, the majority were asymptomatic CMR imaging showed myocarditis (15%) and prior myocardial injury 31%

Timing and risk factors

The prevalence of these abnormalities 71 days after the onset of COVID-19 diagnosis), even in those experiencing mild symptoms. It was independent of severity of the disease, pre-existing conditions, time from original diagnosis, and presence of cardiac symptoms. Increased risk of significant cardiac complications in the early convalescent stage and the long-term period post-acute COVID-19 disease.

Presenting symptoms

Cardiac complications, associated with COVID-19 especially (myocardial injury, and arrhythmias, increasing the risk of heart failure and other complications), even in those experiencing mild symptoms ⁽¹²³⁾.

Diagnosis

- Echocardiographic Magnetic resonance imaging of the heart tissues shows evidence of myocardial damage

Mechanisms; in COVID-19 survivors

- Direct viral invasion *via* ACE2 receptor in cardiac tissue (pericytes, cardio fibroblasts, endothelial cells, pericardial adipose cells, cardio myocytes, and vascular cells).
- Hyperactive inflammatory, and hypercoagulable states associated may explain the risk of thrombotic complications
- Endothelial dysfunction affecting the integrity of the myo- and pericardium may perpetuate cardiovascular damage. Endothelitis may lead to persistent damage to other organs, including the lungs, brain, liver and kidneys.
- Dysregulation of RAS may also create a persistent cardio metabolic demand
- These histopathological changes in the heart reinforces the manifestation of cardiac sequelae in post-acute COVID-19.

- Predisposition to thrombotic complications, which causes diffuse thromboembolic events and intravascular coagulation that, involves different organs. the estimated rate of venous thromboembolism (VTE) was less than 5% (despite many limitations and challenges)

5) Neurological Impairments ^(28,29,68,78)

Estimated prevalence

- Neurological impairments in more than one third (36.4%) of patients
- The persistence of cognitive impairment and motor deficits in a third of the discharged patients reinforces the risk of developing long-term neurological consequences

Risk factors.

Being a male gender associated with increased risk of PCS neurological complications including Guillain-Barre syndrome, but in classical form, there was not any gender difference.

Presenting symptoms; Neurological symptoms and sub-clinical cognitive dysfunction

- Neurological deficits, including strokes, seizures and Guillain-Barre syndrome
- Increased susceptible to developing cognitive decline in particular Alzheimer's disease
- COVID-19 has been linked with the risk of developing Parkinson's disease and Alzheimer's disease
- Neuropsychiatric sequelae that lasted for months' post recovery in the past epidemics, threaten the cognitive health, day-to-day functional status, and overall health and well-being of COVID-19 survivors.

Mechanisms;

In COVID-19 survivors because of interacting and multiple causes

- Direct viral damage to the cortex and adjacent sub-cortical structures, causing direct viral encephalitis
- Indirect non-central nervous system systemic impairment and psychological trauma
- Systemic inflammation; **promote** cognitive decline and neurodegenerative diseases supports the likelihood of neurodegeneration
- Cerebrovascular changes and Peripheral organ dysfunction (liver, kidney, lung).
- Persistence neuropathology through the associated immunosenescence and inflammation, that leads to continuous detrimental effects of on the central and autonomic nervous system
- These abnormalities may either aggravate a pre-existing neurological disorder or trigger a new one.
- ARDS patients often experience subsequent cognitive impairment, executive dysfunction, and reduced quality of life, that can last for months after hospital discharge

6- Gastrointestinal and Hepatic Impairment ⁽⁶⁹⁻⁷²⁾

Estimated prevalence

However, the prevalence and the nature of GI and hepatic manifestations among PASC patients are not yet clear, a Systematic review that included 43 studies with over 18,000 cases reported that

- The pooled prevalence Gastrointestinal (GI) symptoms was 15%.
- Diarrhea was the most common symptom in 11.5% of patients
- Nausea and vomiting were experienced by 6.3%
- Abdominal pain by 2.3% of patients.
- Liver function abnormalities was 19%
- Other met analysis reported that prevalence of nausea or vomiting, anorexia and diarrhea was the most common
- Gastrointestinal sequelae from (study of 117117 COVID-19 patients at 90 days' post discharge) were 44%, Loss of appetite (24%), nausea (18%), acid reflux (18%) and diarrhea (15%) were the most commonly reported gastrointestinal symptoms in this study.

Presenting symptoms;

- Group of gastrointestinal (GI) symptoms, mainly diarrhea, nausea and anorexia
- The severity of the underlying COVID-19 disease correlate with the degree of abdominal pain and hepatic dysfunction.

Mechanisms;

- Despite SARS-CoV-2viral clearance from the airways, even asymptomatic patients the stool exhibited positivity for virus, which remained active
- Viral persistence in the GI tract is a possible explanation for active and prolonged 'quiescent' gut infection.
- Prolonged viral presence in the gut in the pathogenesis of MIS-C through zonulin-dependent loss of gut mucosal barrier and subsequent development of hyperactive inflammation.

7- Psychological Impairments and Post-Traumatic Stress Disorder^[36, 37, 73-79]

Presenting symptoms;

- Including; anxiety, depression, post-traumatic symptoms and cognitive impairment.
- *Stress disorders*; include a variety of clinical manifestations for example obsessions and compulsions disorders, difficulty in concentration, reduced social activities, irritability, aggression, substance use, and cognitive deficit.
- *Post-traumatic stress disorders (PTSD) after recovery*; a category of psychiatric conditions triggered by trauma or other life-stressing factors.
- *Intensive care unit (ICU)-acquired psychological illnesses or neuro-cognitive* such as anxiety, depression and PTSD among ICU admitted patients with mechanical ventilation.
- *COVID-19 recovered patients experience Cognitive/mental health impairments*; such as memory loss delirium, brain fog, hallucination, depression, confusion, and anxiety.

Risk factors for persisting psychological symptoms

Being a female gender, and there is not any evidence that the underlying psychiatric or psychological illness are association with long COVID-19 psychological symptoms.

Estimated prevalence

Even up to six months following COVID-19

- Depression, anxiety occurs in to 26 %
- Sleeping disorders occurs in to 23 % of cases
- PTSD disorder range from 5.8–20%

Mechanisms;

Still unknown, but several factors may be involved;

- Effects of direct viral infection
- Stigma, and social isolation
- Corticosteroid therapy.
- The immunological response.
- Intensive care unit stay,
- Brain inflammatory complications; increase the suicidal ideation and behavior among COVID-19 patients and among survivors without and with post-COVID syndromes

8- Metabolic Impairments ⁽⁸⁰⁻⁸⁴⁾

Estimated prevalence

Increased rate of new-onset hyperglycemia among hospitalized COVID-19 patients with nearly 35% of 551 patients exhibiting persistent hyperglycemia up to 6 months

Presenting symptoms

After clinical recovery

- Defects in lipid and glucose metabolism associated COVID-19
- Lasting metabolic impairments in PASC.
- New-onset diabetes and associated diabetic ketoacidosis. May predispose patients to increased risk of poor clinical outcomes and long-term hyperglycemia and also exhibited a higher clinical score and required a longer in-hospital stay.

9- Post Viral Olfactory Dysfunction ^(85, 86, 91,92)

Estimated Prevalence

Olfactory dysfunction ranged (41.0–61.0%) after one month

Diagnosis

- The butanol threshold test (BTT)
- The cross-cultural smell identification test (CCSIT) (Sen Sonics, Inc., Haddon Heights, New Jersey).

Mechanism

Post viral olfactory loss occurs abruptly due to viral infection of the olfactory neural system in the nose.

Management; (combination therapy).

- Oral prednisolone for 2 weeks; The dosage of prednisolone was tapered over 2 weeks as follows: 30 mg/d for the first 3 days, 20 mg/d for 4 days, and 10 mg/d for 7 days
- Ginkgo biloba (Ginexin; SK Pharmaceuticals, Suwon, Korea) for 4 weeks. Eighty milligrams of G biloba was administered three times daily for 4 weeks.
- Two puffs of mometasone furoate nasal spray per nostril twice daily for 4 weeks.
- There are few frustratingly interventions e.g. Olfactory training

Prognosis

Follow-up revealed that over 80% of the patients reported subjective recovery after one year. The more favorable prognosis was associated with longer follow-up duration and female gender.

10 - Post Viral Taste Dysfunction ⁽⁸⁶⁻⁹¹⁾

Estimated Prevalence

- Gustatory dysfunction ranged between 38.2-49.0%

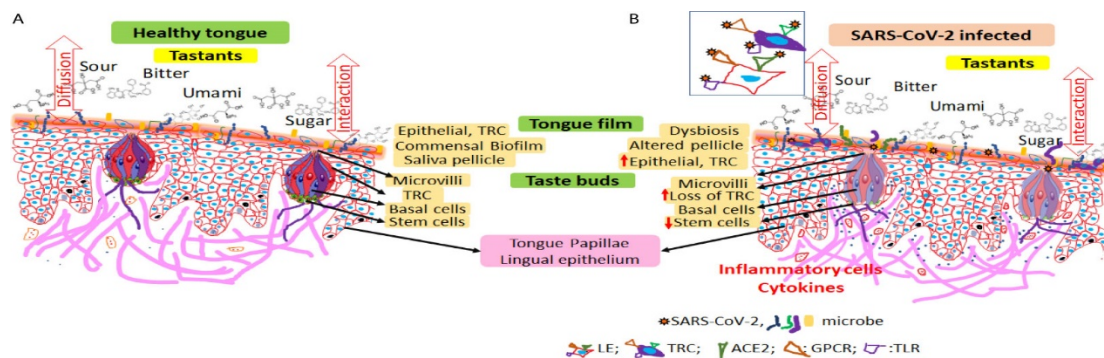
The symptoms

- Hypogeusia
- Dysgeusia

Mechanism

Multiple, and high expression of SARS-COV-2 entry receptors in oral epithelial taste bud cells, in addition to sialic acid and the toll like receptors (TLR) as host receptors leads to loss of taste through significant SARS-CoV-2 viral infection and replication that interfere with the glycoproteins mediated transport of taste, and also promotes a favorable environment for co-infections.

Fig 6 : Schematic representation of potential mechanisms for taste dysfunction in long COVID-19.



Prognosis

Recovery became more stagnant after 2 months with a subsequently little improvement

Management

Few frustrating interventions such as oral/topical corticosteroids, and phosphodiesterase inhibitors, are still under studies.

11 - Post Viral Menstrual irregularities ^(92- 97)

Estimated Prevalence

One out of five athletes' female reported menstrual cycles change after the onset of infection
Twenty-five percentage of women reported menstrual irregularities one month after infection

The symptoms

Twenty percentage reported decrease in menstrual volume and less frequently amenorrhea

Mechanism

Although the exact mechanism is not clear, it can be explained by;

- The effect COVID-19 illness immune stimulation by the immune cells biologically mediated effect in the uterus lining in changing the hypothalamic-pituitary-ovarian (HPO) axis and endometrial function.
- COVID-19 has a direct effect on the female reproductive system through ACE2 receptors, which found on ovarian and endometrial tissues
- HPO axis (which regulates the menstrual cycle) is disturbed by both energy deficit, stress. COVID-19 Infection leads to large energy deficits which disrupt the luteal phase, and may cause anovulation

12) The hidden long-term cognitive effects of COVID-19

Estimated Prevalence

The virus also attacks the nervous system as more than 40% of patients showed neurologic manifestations at the outset

- More than 30% of those had impaired cognition. (Worldwide, more 27 million, in addition to 7 million Americans and another.
- Mild brain damage occurs in many survivors.

Pathophysiology

By brain damage by;

- lack of oxygen
- COVID infection is a risk factor for strokes
- Directly cause of Encephalitis, with its devastating or subtle consequences

Risky individuals;

- Being over 70 years of age were at risky for covid-19 related stroke,



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- COVID_ 19 infected Young individuals are risky seven times to have a stroke than a typical flu virus.
- Megakaryocytes (large cells in the brain capillaries of died infected COVID-19 patients) make platelets. These cells related to strokes in individuals with COVID-19.

The presenting symptoms

- Impairment in sustained attention — the ability to attend to important information for as long as it is relevant.
- Pervasive subtle behavioral problems
- Cognitive problems
- Psychological problems
- Can even lead to death.

Diagnosis

Clinical diagnosis of cognitive impairment

Performance-based cognitive function e.g.

- Montreal Cognitive Assessment (MoCA)
- Mini Mental Status Examination (MMSE)
- Compass 31 (for dysautonomia)
- Telephone interview for cognitive status (TICS)
- screen for cognitive impairment in psychiatry (SCIP)

Chapter 2;

Post COVID-19 clinical care service in KSA

Contents

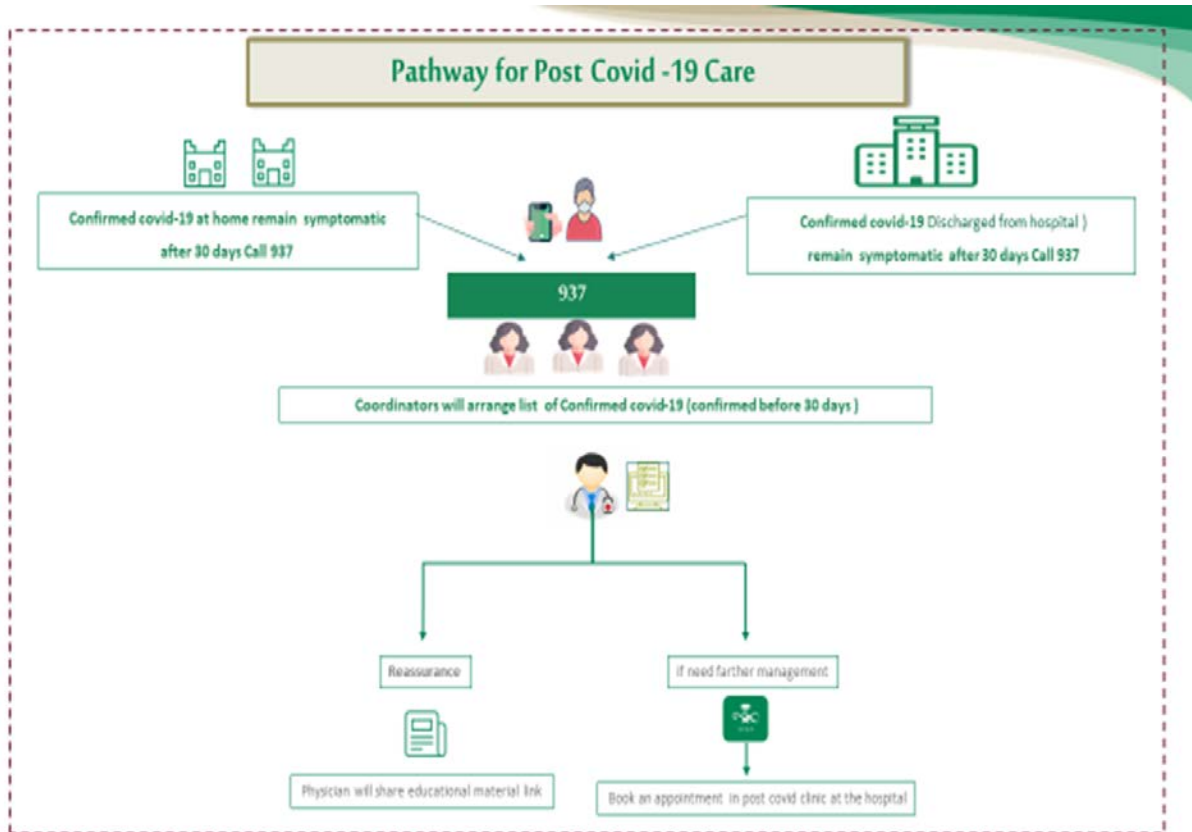
- Principles of Post-COVID-19 Clinical care in KSA
- Flow chart of the Post-COVID-19 Clinical care in KSA
- The role of Health care providers
- Post-COVID-19 virtual assessment
- The role, and requirements for the appropriate Primary Health Care Centers
- Post-COVID-19 clinical care in secondary Health Care Centers

Principles in Principles of Post-COVID-19 Clinical care in KSA

- **Sharing Information** ; Through the national electronic strong registry system at the health facilities ,and across all the three levels
- **Continuity of care** ; For 24h/7d between the primary promoting through the educational virtual services , secondary (screening , early detection ,and proper management) , and tertiary
- **Comprehensiveness multidisciplinary teams** ; to cover all the affected domains associated with a spectrum of physical, social, and psychological consequences)
- **Transparency** ; for all the reported national results , and the published results and papers
- **Free services** to all the inhabitants in KSA
- **The ethical rights** ; This project is owned by the Saudi MOH , with IRP approval number so its not allowed to share any of its related data except after an official permission
- **Evidence based** ; follow the recent published guidelines
- **Flexible , and updated** ; ,and well tailored nased on our national resouces,
- **Share knowledge, skills and training between** services to help practitioners in the community provide assessments and interventions

Flow chart of the Post-COVID-19 Clinical care in KSA

Fig 7; National Post COVID-19 Clinical Care Project flow chart in KSA



The role of General Practice ⁽⁹⁸⁻¹⁰⁰⁾

Importance; plays a key part in the Long COVID clinical pathway because with previously confirmed COVID-19, may present with a wide range of symptoms including breathlessness, fatigue, chest pains, cognitive impairment or psychological symptoms.

The initial role is to

- 1) Exclude acute or life-threatening complications and other unrelated diagnoses.
- 2) Holistic Clinical assessment may include blood tests, chest X-rays or clinical tests
- 3) Treatment plans
- 4) referral to the relevant acute or specialist services may be required based on the identified predominant symptoms

A mental health condition a referral should be to the existing local mental health pathways, both for adults and children.

Virtual Post-COVID -19 Clinical care in KSA

Introduction

Although remote assessment may be appropriate, in some cases, a physiologic evaluation of patients with prolonged symptoms should be combined with a review of functional status and mental well-being.

Through; 937, Ministry of Health, KSA

Target population

- All confirmed positive COVID-19 cases (SARS-CoV-2 RT-PCR reverse transcription polymerase chain reaction test (in nasopharyngeal swab)
- Asymptomatic, and /or symptomatic cases
- All inhabitant in KSA (Saudi, and non-Saudi)
- Both sexes and all age groups

Aim; to improve the overall health status, quality life of COVID-19 cases, through providing a comprehensive, continuous, evidence based clinical care to all COVID-19 cases in Kingdom of Saudi Arabia with rationalized use of resources, through the following objectives

- To provide a national based data set, analyze the medium-long term persistent symptoms through a comprehensive and structured clinical assessment in patients recovered from COVID-19 as regards, recovery rate, and prognosis.
- To explore, assess, and study the Post COVID-19 related morbidity and mortalities
- To proactively provide the appropriate and effective health care to post COVID-19 cases in terms of (Educate, reassure, manage, and referral) the post- COVID-19 cases about the self-care.

The assessment tool includes⁽¹⁰⁸⁻¹¹⁴⁾

- A. The Demographic, special habits, comorbidities, medications, and COVID-19 vaccination history
- B. The history, symptoms of COVID-19 (onset, course, duration, severity)
- C. Post-COVID conditions are associated with a spectrum of physical, social, and psychological consequences Check list to 50 covid-19 related symptoms
- D. The post –COVID -19 assessment through Self-assessment (screening tools);
 1. *Medical research council (MRC)* dyspnea scale uses a scoring from 1 to 5 to grade exertional dyspnea from mild to severe, respectively
 2. *Metabolic equivalent of task (MET)* score was used to assess exercise tolerance The activities are divided into 10 variables ranging from at rest to performing simple activities



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3. *Chronic fatigability syndrome (CFS)* questionnaire was used to score *eight fatigue related symptoms*, such as short-term memory problem, sore throat, sore lymph nodes, muscle pain, joint pain, headache, difficulty sleeping, extreme fatigue after exertion. Based on the sum of the scores for these eight variables, the patients were classified according to chronicity into: normal, chronic idiopathic fatigue, CFS-like with insufficient fatigue syndrome and CFS.
4. *World Health Organization-five well-being index (WHO-5)* used to measure the mental well-being of participants over the past 2 weeks. Five psychological wellbeing parameters were scored

Referral

- To Post –COVID-19 clinics in hospitals
- To emergency room (ER)
- To PHCCs

Indication of referral to PHC

- a) Presence of two or more from the following demographic variables in a symptomatic case
 1. Age more than 60 y
 2. **Obesity = BMI of 30 or greater**
 3. Number of Co-morbidities) more than three co –morbidity)
 4. Has one of the following
 1. Autoimmune disease
 2. Cancer
 3. On –dialysis
 4. Previous history of cancer
 5. Immune suppression medication
- B) Requires Clinical examination (Specific organ / system lesion) e.g
- ✓ *Medical research council (MRC) dyspnea scale* used to measure perceived respiratory disability (17), a scoring from 1 to 5 to grade 120 exertional dyspnea from mild to severe, respectively (18) then classified MRC severity grouping into
 - Mild (Breathlessness with strenuous exercise)
 - Moderate (Short of breath when hurrying on the legs and Stops for a breath after walking a few steps)
 - **Sever (Too breathless to leave the house or breath when dressing and Walks slower than people of the same age)**
- c) Requires laboratory investigation
- D) Requires imaging
- E) Required medications or Prescriptions
- ✓ *Chronic fatigability syndrome (CFS) questionnaire* composed of eight fatigue related symptoms, such as short-term memory problem, sore throat, sore lymph nodes, muscle pain, joint pain, headache, difficulty sleeping, extreme fatigue after exertion. Based on the sum of the scores for these eight variables, the patients were classified according to chronicity into:

- Not fatigued /normal – zero
 - **chronic Idiopathic Fatigue (CIF) with ≤3 symptoms**
 - CFS-like with insufficient fatigue syndrome 1-2
 - **CFS with ≥4 symptoms**
- ✓ **World Health Organization-five well-being index (WHO-5)** was used to measure the mental well-being to assess both positive and negative well-being of participants over the past 2 weeks. Five psychological wellbeing parameters were scored and multiplied by 4 giving a final score in the range from 0 representing the worst wellbeing to 100 representing the best well-being quality of life (20). The raw score ranges from zero to 25.
- 0-25
 - 25-50
 - 50-75
 - >75
- ✓ **Patient self-report Functional Status (PCFS) scale**⁽¹⁶⁾ is a new scale recommended to be used during the current COVID-19 pandemic to display direct retrieval and to assess the functional sequelae, and to monitor direct recovery after the SARS-CoV-2 infection upon discharge from the hospital, at 4 and 8 weeks post-discharge the PCFS scale grades cover the entire range of functional limitations, and concerns the average situation of the past week
- Grade 0----- No functional limitations
 - Grade 1---- Negligible functional limitations
 - Grade 2----Slight functional limitations
 - **Grade 3----Moderate functional limitations**
 - **Grade 4----Severe functional limitations**

The role, and requirements for the appropriate PHC for the post-COVID -19 Clinical care in KSA (98-104)

Setting; Post-COVID conditions should be diagnosed and managed in PHCs

By; the primary care providers^(32- 34)

Model; a patient-centered medical home model

Aim; 1) Complete Clinical Evaluation, and response to treatment

2) Referral; to Multidisciplinary post-COVID Clinical care clinics in hospitals based in a single physical comprehensive examination to provide coordinated treatment approaches to COVID-19

Type; Any the catchment area (referral scope)

Primary Health Care for the post-COVID -19 Clinical care include the following;

- ❖ With an active Electronic register system
- ❖ With a Plain X- ray device
- ❖ Well-structured appropriate 3 clinics
- ❖ With an active lab fulfilling the standard criteria
- ❖ Medications, diagnostic tools based on the guideline

The logistics;

- ❖ *Sharing information Direct report to the MOH team*
- ❖ *Follow the national post- COVID-19 updated guideline*
- ❖ *Active referral system*
- ❖ *Listed in Maweed system as (Post COVID-19 clinic)*
- ❖ *Essential laboratory investigation Complete blood count, Blood chemistries, including electrolytes, blood urea nitrogen (BUN) and serum creatinine, Liver function studies, including serum albumin.*
- ❖ *Specific for Post-COVID includes; C-reactive protein (CRP), D-dimers, Ferritin, Brain natriuretic peptide (BNP), troponin, Lymphocytes, Lactate dehydrogenase, CK., Thyroid studies, Antinuclear antibody, creatinine kinase Interleukin-6 (IL-6), and N-terminal (NT).*

Team; coordinated comprehensive care and open communication among a core group of specialty care providers and support services (e.g., occupational therapy, physical therapy, social work) to maximize functional improvement and rehabilitation efforts.

The required medical staff; (Based on evidence and literature the reported % of post-COVID symptoms) *required.

- ❖ Trained Family Medicine consultant *
- ❖ Health Educator *
- ❖ Mental, and psychological Health care services or social worker*
- ❖ Radiology technician *
- ❖ Lab. Technician *
- ❖ Qualified trained nurse *
- ❖ Chest resident or specialist *
- ❖ Physiotherapist or technician

The Post-COVID-19 Clinical Care in Secondary Health Care Settings

Referral through

PHCCS

Post-COVID-19-virtual clinic in 937

The logistics:

- Provide access within 5 days to
- Dedicated clinic in Ma'ad for post-COVID -19 care---- Active referral system according to hospital policy to----- post-COVID -19 Clinic in hospital

Timing; 1-2 clinic pre weeks

Lead by Internal medicine to assess to all hospital service.

Duration; 20 min per patient

Workflow; Regular setup for clinic with referral system to multidisciplinary subspecialties team
Once treatment is fulfilled and patient will be given a discharge summary to the internal medicine (owner of post COVID-19 clinic) and in turn be referred to primary care.

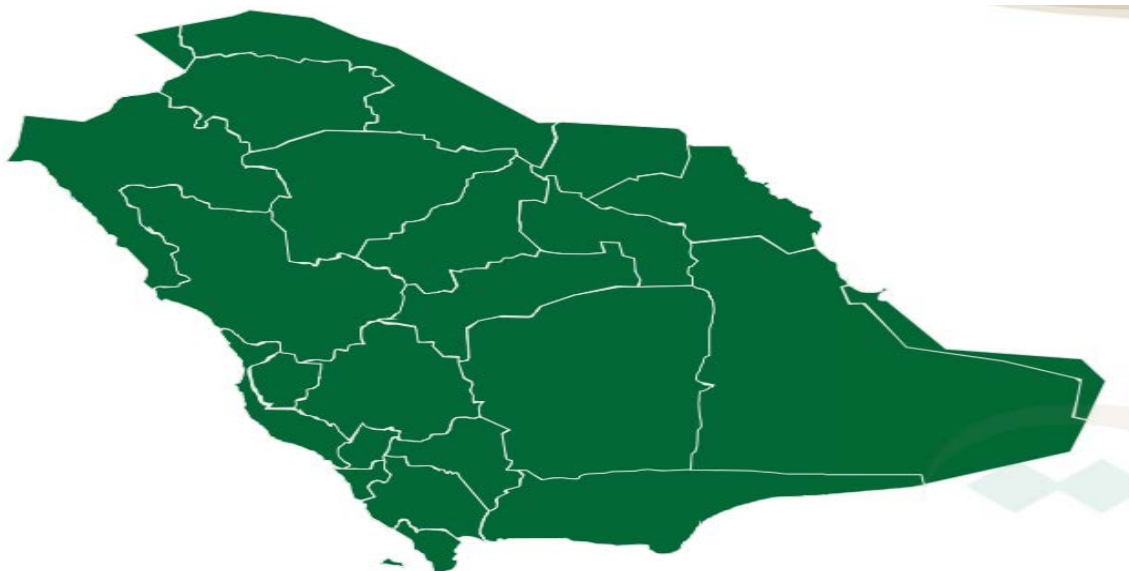
Team;

1. Mental health services (psychiatry and psychologist)
2. Rehabilitation.
3. Pulmonology, cardiology, hematology, end urology etc.

Reference; Follow the post- COVID-19 updated guideline.

Documentation; sharing information with direct report to hospital directorate in region/ cluster.

Location; all regions in KSA



Reporting and coding ⁽¹⁰⁵⁾

Morbidity and mortality coding for COVID-19 in ICD-10 and ICD-11

ICD	Description of codes
ICD -10	<ul style="list-style-type: none"> • An emergency ICD-10 code of "U07.1 COVID-19, virus identified" is assigned to a disease diagnosis of COVID-19 confirmed by laboratory testing. <ul style="list-style-type: none"> • An emergency ICD-10 code of "U07.2 COVID-19, virus not identified" is assigned to a clinical or epidemiological diagnosis of COVID-19 where laboratory confirmation is inconclusive or not available. • Both U07.1 and U07.2 may be used for mortality coding and tabulation as cause of death.
ICD-11	<p>The code for the confirmed diagnosis of COVID-19 is RA01.0. The code for the clinical diagnosis (suspected or probable) of COVID-19 is RA01.1.</p>

Coding

Based on the International Classification of Diseases, Tenth Edition Clinical Modification (ICD-10-CM). WHO has coding the post-COVID conditions as (1)

- **U09.9; Post COVID-19 condition, unspecified** – to allow the establishment of a link with COVID-19; not to be used in cases that still are presenting with acute COVID-19 N.B until now unavailable in the United States
- **B94.8; Sequelae** of other specified infectious and parasitic diseases is used, It's the recommended code by CDC in US to use for post-COVID conditions till reviewing the U09.9 code review by the U.S. ICD-10 Coordination and Maintenance Committee.

Chapter 3; The holistic Post-COVID-19 clinical assessment

Contents

- Approaches
- Documentations
- Red flags
- Detailed history
- Current Symptoms
- Differential diagnosis
- Clinical assessment
- Laboratory Investigations
- Imaging

Holistic Post-COVID-19 clinical assessment

Approach

- 1) A 'safety-first' approach through addressing safety questions to avoid Post Exertional Symptom Exacerbation (PESE) so that we do not do too much with them. Others directed diagnostic testing are required as the clinical assessments may be uninformative and that excessive testing could be potentially harms for example increased risk for incidental findings, anxiety about abnormal results without clinical significance, imaging-related radiation exposure, and cost.
- 2) Assessment; assessment may not be a one-off occurrence because symptoms can be relapsing and remitting, with new symptoms appearing. All assessments, whether the first or on an ongoing basis, should consider physical, psychological and cognitive problems.
- 3) Conservative diagnostic approach (4 to 12 weeks) following SARS-CoV-2 infection. Investigations may be normal or no diagnostic in post-COVID conditions and symptoms will improve or resolve in some patients, further supporting an initial conservative approach to diagnostic testing.

Documentations

Better to be within electronic health records to help in the evaluation and monitoring of the post-COVID health status and conditions. Moreover, Functional testing essential for the quantitative documentation of the clinical status over time.

When symptomatic Post-COVID-19 consult healthcare professionals if

- 1) Developed or have persisting symptoms beyond 12 weeks of recovery
- 2) If your symptoms have worsened or changed

Red Flags; (urgent and potentially life-threatening clinical conditions)

NICE recommends urgent escalation to acute services for those experiencing:

- Severe hypoxemia or oxygen desaturation on exercise.
- Signs of severe lung disease.
- Cardiac chest pain (Myocardial infarction.)
- Multisystem inflammatory syndrome (in children).
- Pulmonary embolism.
- Pericarditis with effusion.
- Stroke.
- Renal failure.
- Symptoms that persist beyond three months should prompt further evaluation

Detailed History

- A) *Detailing the history of acute onset of COVID-19 infection disease, including;*
 - ✓ symptoms
 - ✓ Biometric readings (e.g., oxygen saturations).
 - ✓ The subsequent clinical course is essential.
- B) **Serious complications include** pulmonary embolus, heart failure, stroke, myocardial infarction, lung fibrosis, neurologic derangement, and severe deterioration in mental health.
- C) **Medications**, including over-the-counter and alternative therapies, should be checked.
- D) **Social history** may reveal relevant issues, such as isolation, economic hardship, pressure to return to work, bereavement, or loss of personal routines (e.g., shopping, church), which can impact patients' well-being

Current symptoms

1) Should be evaluated

- Attributable to different underlying pathophysiologic processes
 - Presentation could be complicated by a number of factors
 - May share similarities with other post-viral conditions
- 2) Should be noted and prioritized
- 3) **Red flag symptoms**, such as chest pain, should be carefully explored.

Evaluation for alternative diagnoses; Because not all illness in the recovering patient not caused by post-acute COVID-19. (e.g., deteriorating comorbidities, infection, endocrine disturbance) is vital

Past History

e.g. **Oxygen Saturation; require** additional evaluation if;

- ✚ Oxygen saturation persistently below 95%.
- ✚ In patients whose oxygen saturation is 96% or above at rest,
- ✚ Tests for exertional desaturation (e.g., 40 steps around the room and, if negative, followed by a one-minute sit-stand assessment supervised by a health care professional) may be informative.¹⁰ If the exertional test results in a drop of 3% or more in oxygen saturation, further assessment is warranted.
- ✚ Home self-monitoring of oxygen saturation using a patient diary may provide further reassurance.

Clinical Assessment tests

Measuring blood pressure; including sit-to-stand or lying and standing blood pressure, depending on the person's signs and symptoms (as per NICE/SIGN/RCGP guidance).

Ambulatory pulse-oximetry for cases with respiratory symptoms, fatigue, or malaise.

Orthostatic vital signs for cases reporting postural symptoms, dizziness, fatigue, cognitive impairment, or malaise

The multi-system assessment of COVID-19; and its psychological impact mean that a broad holistic assessment is most beneficial.

- Post-exertion malaise, fatigue and neurologique symptômes
- Assessment and management of breathlessness
- Assessment and management of dysfunctional breathing
- Assessment and management of oxygen requirements
- Symptom or palliative care management where required
- Consideration of rehabilitation needs and onward referral where required
- Cognitive function
- Consideration of a new diagnosis of venous thromboembolic disease (VTE)

III) Table 3--Summarization of various assessment tools for evaluating people with post-COVID conditions

Post-COVID-19 conditions	Tools
Exercise capacity tools scheduled for a follow-up appointment <i>N.B</i> Ensuring the best testing circumstances to support the maximum performance.	<ul style="list-style-type: none"> • 1-minute sit-to-stand test • 2-minute step test • 10 Meter Walk Test (10MWT) • 6-minute walk
Balance and fall risk tools	<ul style="list-style-type: none"> • BERG Balance Scale • Tinetti Gait
Balance Assessment tools	<ul style="list-style-type: none"> • Tilt-table testing (e.g., for POTS) • Orthostatic HR assessment
Functional status and/or quality of life tools	<ul style="list-style-type: none"> • Patient-Reported Outcomes Measurement Information System (PROMIS) (e.g., Cognitive Function 4a) • Post-Covid-19 Functional Status Scale (PCFS) • EuroQol-5D (EQ-5D)
Respiratory conditions tools	<ul style="list-style-type: none"> • Modified Medical Research Council Dyspnea Scale (mMRC)
Neurologic conditions tools	<ul style="list-style-type: none"> • Montreal Cognitive Assessment (MoCA) • Mini Mental Status Examination (MMSE) • Compass 31 (for dysautonomia) • Neurobehavioral Symptom Inventory
Other conditions tools	<ul style="list-style-type: none"> • Wood Mental Fatigue Inventory (WMFI) • Fatigue Severity Scale • Insomnia Severity Index (ISI) • Connective Tissue Disease Screening Questionnaire
Rehabilitation needs assessment (e.g., for sleep, mobility, bowel bladder function, cognition, pain, and daily living activities) .	American Academy of Physical Medicine & Rehabilitation's functional assessments
Psychiatric and Psychosocial conditions assessment tools e.g. traumatic bereavement, risk to self and/or others, COVID related life stresses such as debt, unemployment, relationship issues) and onward referral where required	<ul style="list-style-type: none"> • General Anxiety Disorder-7 (GAD-7) for anxiety disorders • Patient Health Questionnaire-9 (PHQ-9) for depression • PTSD Symptom Scale (PSS) • Screen for Posttraumatic Stress Symptoms (SPTSS) • PTSD Checklist for DSM-5 (PCL-5) • Impact of Event Scale-Revised (IESR) • Hospital Anxiety and Depression Scale (HADS) psychosis screen

Laboratory investigation

Timing

The temporal criteria used (three weeks up to many months following SARS-CoV-2 infection).

Principle

Testing should be tailored to the patient's symptoms and presentation

I) Antigen testing for COVID-19 infection

People are not infectious; Past 9-10 days' post symptom onset if they have asymptomatic or mild disease. After severe disease (hospitalized patients), people typically do not shed virus after three weeks. Initial statistics indicate that viral shedding was not associated with Long-COVID. Although generally people were not found to be infectious, but if health care, professional may advised to have a test when necessary.

Positive SARS-CoV-2 viral test (i.e., reverse transcription polymerase chain reaction [RT-PCR] test to assess current infection, PCR are not 100% sensitive.

II) Serologic (antibody) test testing

10-20% of asymptomatic cases may have no detectable antibodies may be used to assess previous infection; however, these laboratory tests are not required to establish a diagnosis of post COVID-19 conditions (24, 25)

III) Basic; Blood tests, to assess the affected organs or systems, tests may include

Table 3 ,The clinical assessment based on; your symptoms and signs should guide recommended tests.

Type	Includes
Blood count, electrolytes, and renal function	Complete blood count /basic metabolic panel/ urinalysis/ Electrolytes Measurements.
Liver function	Liver function tests or complete metabolic panel
Inflammatory markers	C-reactive protein (CRP)> 0.5 mg/dL Erythrocyte sedimentation rate Ferritin to evaluate inflammatory and prothrombotic states
Kidney function	

Thyroid function	TSH and free T4
Vitamin deficiencies	Vitamin D, vitamin B12
Rheumatologically conditions	Antinuclear antibody, rheumatoid factor, anti-cyclic citrullinated Peptide, anti-Cardiolipin, and Creatine phosphokinase
Myocardial injury	Troponin T > 14 ng/L
Coagulation disorders	D-dimer > 0.5 mg/mL fibrinogen
Others	<ul style="list-style-type: none"> • Lymphocytes <1500 per mm³ • Lactate dehydrogenase > 250 U/L • CK > 170 U/L • Interleukin-6 (IL-6), • N-terminal (NT)-
Differentiate symptoms of cardiac versus pulmonary origin	B-type natriuretic peptide Brain natriuretic peptides. > 150 mg/L <ul style="list-style-type: none"> • pro hormone BNP (NT-proBNP) <ul style="list-style-type: none"> ☐ 4/ >years old, >450 pg/mL ☐ 50–75 years old, >900 pg/mL

2) Imaging

Such as;

1) X-rays patients with

- Imaging may not be needed otherwise if cough and breathlessness are mild and improving
- Requested at 12 weeks or earlier, and should be repeated if
 - Acute COVID-19 and abnormal findings on chest imaging
 - Significant respiratory illness

2) Patient with cardiac symptoms

12-lead electrocardiograph if findings;

- ✓ Normal, ----- can be reassuring
- ✓ Abnormal----- combined with concerning clinical and blood test findings, should prompt further cardiac investigation.¹¹

Chapter 4; The management Plans of Post- COVID-19

Contents

- V. Preventive care
- VI. Treatment plans
 - Patient education
 - Encourage Patient to use diaries and calendar
 - Patient assurance
 - Supportive care
 - Symptomatic, and rehabilitation care
 - Medical treatment
 - Optimizing management of underlying medical conditions
- VII. Follow up plans and advice assessment;
- VIII. Referral

The management Plans ⁽¹⁰¹⁻¹²²⁾

There are no official guidelines for the management of long COVID, Recognizing and validating the impact of illness on quality of life should be part of the ongoing healthcare professional and patient interaction. However, a recent review has highlighted some important principles, which we will briefly summarize.

Primary Prevention;

There are no medications to prevent Long-COVID. However, some suggested measures that may help include:

- COVID-19 vaccine with the three booster doses
- Follow the preventive measures (Mask, hand sanitization, and safe distances)
- Consult your health professional about your symptoms including mental health symptoms if any.
- Ask about possible outcomes of the symptoms
- Keep a log of your symptoms and track progress and recovery.
- Seek information on how to manage your symptoms.
- Be aware of possible symptoms that may need urgent attention.
- Whom to contact in case of emergency.

Treatment plans

There is limited data on Long-COVID and research is ongoing. Recommended management for most patients in the outpatient setting as PHC indications; the health care provider.

Patient education; healthcare professionals should;

- ✓ Advise cases that post-COVID conditions are not yet well understood.
- ✓ Assure them that support will continue to be provided as new information emerges.
- ✓ Continue to discuss progress and challenges and reassess goals as needed.
- ✓ Commonly after COVID-19 Symptoms did not explain by, or out of proportion to objective findings and should not be dismissed even if there is not yet a full understanding of their etiology or their expected duration

Encourage Patient to use diaries and calendars; to report any new or changing symptoms, or health conditions and any changes in activities or routines the changes, especially in relation to certain trigger events such as menstruation, foods, exertion (physical and cognitive), and treatments or medications, and provide greater insight into patients' symptoms and lived experience for healthcare professionals

Patient reassurance; Patients presenting with no serious symptoms benefit from support and reassurance through a natural process of convalescence. Reassurance based on the patient's history and reinforcement of adaptive behavior)

Holistic support for patients with Post-COVID Conditions

This therapy usually works in tandem with other types of therapy and can be integrated into both time-limited and long-term therapies.

The resources of support;

- Healthcare professionals
- Peer support resources (e.g., patient support groups, online forums).
- Support groups are connecting individuals, providing support, and sharing resources for persons affected by COVID-19 (see Resources). When material, employment or other social support needs are identified, healthcare professionals should consider referral themselves (if they are knowledgeable and able) and engaging a social worker, caseworker, community health worker, or similarly trained professional to assist.

Techniques of Supportive Psychotherapy;

(Praise/Reassurance/Normalizing/Encouragement/Reframing /Advice and Teaching (reeducation)/Language/suggestion/counseling. "e.g.

- Normalizing is a form of reassurance must not extend to pathological fears or relationships, and reassure the patient that their experiences, thoughts, and feelings are not unusual or pathological.
- Praise must be accurate and sincere to be meaningful as a supportive to reinforce accomplishments or positive changes in behavior.

Supportive therapy; works through (formal and informal sessions)

- Alliance building: by expressing interest and empathy, and by using a more informal conversational style to help clients feel more comfortable with their therapists and make developing a rapport seamless.
- Esteem building: by reassuring and normalizing thoughts and feelings, and providing encouragement.
- Skill building: by equipping clients with tools and offering guidance in anticipation of life stressors to maximize their adaptive capacities
- Reducing and preventing anxiety: by normalizing, rationalizing, and reframing thoughts and feelings. Anxiety is a normal part of everyday life, and when therapists help clients to realize this, they can then work together to examine and rethink situations.
- Expanding awareness: through clarification, confrontation, and interpretation.

Symptomatic, and rehabilitation care; Many post-COVID conditions can be improved through already established symptom management approaches (e.g.)

- ✓ Nonspecific symptoms and dominated by fatigue, consists of emotional support, ongoing monitoring, symptomatic treatment (e.g., acetaminophen for fever).
- ✓ *Patient with persistent cough and breathlessness;* **benefit** from simple breathing exercises to improve symptoms of dyspnea, (slow, diaphragmatic breathing with a 1: 2 inspirations to expiration ratio several times per day). *Breathing exercises*).
- ✓ *persons with post-exertional malaise;* A conservative physical rehabilitation plan (include physical and occupational therapy, speech and language therapy, vocational therapy)
- ✓ *patients with cognitive symptoms;* Neurologic rehabilitation patient with pacing (activity management) may be useful consultation with psychiatrist
- ✓ Activity management (pacing) for post-exertional malaise
- ✓ Formal rehabilitation is often helpful if the initial respiratory illness was severe, but not for milder illness.
- ✓ *Mental health and well-being* may be greatly improved by reestablishing social connections, community and peer support, and attention to structural determinants (e.g., measures to mitigate poverty, fight discrimination, and achieve social justice). Psychiatric referral may be appropriate for some patients.
- ✓ Gradual return to exercise as tolerated could be helpful for most patients
- ✓ Exercise role in recovery is controversial, should be counseled to pace themselves carefully and cut back if symptoms worsen.

N.B-- Specific guidance has been published for athletes returning



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Ministry of Health

Medical Management

- ✓ The goal is to optimize the quality of life and function among Post-Covid-19 cases, for appropriate goal setting transparency is essential.
- ✓ Setting achievable goals through shared decision-making can be beneficial.
- ✓ The medical management based on the presenting symptoms, the comorbid medical and psychiatric health conditions, and the treatment goals.
- ✓ FDA-approved;
 - ✚ Over the counter medications
 - ✚ Vitamin
 - ✚ Electrolyte supplements may be helpful for indicated illnesses (e.g., headache, anxiety)
- Documented deficiencies (e.g., vitamin deficiency) after carefully weighing the benefits and risks of pharmaceutical interventions. Some treatments have been offered that lack evidence of efficacy or effectiveness, and could be harmful to patients. Healthcare professionals should inquire about any unprescribed medications, herbal remedies, supplements, or other treatments that patients may be taking for their post-COVID conditions

Optimizing management of underlying medical conditions might include counseling on lifestyle components such as stress reduction, nutrition, and sleep (e.g., meditation).

Follow up plans and advice assessments;

Including attention to comorbidities. to sports participation. Follow-up visits with a healthcare professional might be considered every 2–3 months, with frequency adjusted up or down depending on the patient's condition and illness progression.

Among general; the interval of follow up was determined based in studies around the world, which reported various incidence rates for long covid with different follow-up examination times after the acute infection, including these finding are not fully corroborative.

- 32%-87% at the 60 day (2m)
- 96% at 90 days.
- 76% of people at 6 months,

After discharge from the hospitals into a post-COVID assessment service. Most appropriate from 12 weeks for many,

- Some people need it earlier (from 4 weeks as per NICE guidance).
- The timing is based on individual need and is at the discretion of the assessing clinician. However, although recovery time is different for everyone, for many people symptoms will resolve by 12 weeks.

Referrals if specific organ systems are involved or if you need further care.

CDC with thirteen U.S. medical professionals' expertise during March and April 2021. Clear referral pathways to clinical specialties to provide an appropriate care for post-COVID-19 patient's conditions include:

- Specialist lung disease services sleep services, and pulmonary rehabilitation
- Adult and Pediatric Pulmonary Medicine
- Cardiac services including cardiac rehab
- Critical Care Medicine
- Neurology
- Rheumatology
- Dermatology
- Infectious Diseases
- ENT
- Infectious disease services
- Gastroenterology
- Physical Medicine and
 - Co-morbidity management e.g. for diabetes or obesity
- Occupational health
 - Multidisciplinary rehabilitation services
 - Physiotherapy
 - Occupational therapy
- Dietetics and nutrition services
- Pain management
- Nephrology • Hematology
- Fatigue services
- Social care support services
- Primary care led care including care coordinators and social prescribers
- Improving Access to Psychological therapies (IAPT) and other mental health services including cognitive management

Chapter 5; Special Conditions COVID-19 in Children

Incidence;

- The true incidence is unknown due to lack of testing and the prioritization of adults with severe illness.
- Children have less severe COVID-19 illness
- Hospitalization rates in children are significantly lower than adults
- Globally, fewer cases of COVID-19 have been reported in children (age 0-17 years) compared with adults due to community preventive measures and school closures.

Pathophysiology;

Children similar to adults as regards;

- Viral loads like adults from their nasopharynx,
- Secondary infections rates
- Same average and range of incubation period (2 -14 days).
- Same clinical picture (Fever, fatigue, Headache, Myalgia, Cough, Nasal congestion or New loss of taste or smell, Sore throat, difficulty breathing, Abdominal pain, Diarrhea, Nausea or vomiting, Poor appetite or poor feeding, many non-specific symptoms e.g. few (upper respiratory symptoms or only gastrointestinal symptoms), or may be asymptomatic.
- Testing and Recommendations for Isolation

The clinical picture

- Cough and/or fever were the most common presenting symptoms
- 16% are asymptomatic,
- Lack of specific signs or/and symptoms are challenging.
- Age <1 year, and comorbid infants might be at increased risk for severe illness from SARS-CoV-2 infection

Testing for School-Aged Children

- School-aged children should be prioritized for viral testing if they have: Signs or symptoms of COVID-19 / close contact (within 6 feet of someone for a total of 15 minutes or more) with a person with laboratory-confirmed or probable SARS-CoV-2)

Isolation, and Quarantine for School-Aged Children

- Safe for children who have had, or were exposed to, COVID-19 to return to school or be with people outside the household.
- Return to school policies for infected children with should be based on CDC's recommendation for discontinuation of home isolation.

Management and Evaluation

CDC's guidance for the evaluation and management of neonates at risk for COVID-19
details specific testing considerations for newborns

Post-COVID-19 infection among Children.; There is no Published literature

Chapter 6; Appendixes

Patient education material
دعم وإعادة التأهيل والرعاية الذاتية لمرضى كوفيد-08

The assessment tool
استبيان التقييم المبدئي
ما بعد الإصابة بفيروس كورونا

Additional sources

دعم وإعادة التأهيل والرعاية الذاتية لمرضى كوفيد-08

الاسم:

تاريخ الخروج:

المستشفى المعالج:

اخصائي الرعاية الصحية الذي قدم المنشور:

اسم اخصائي الرعاية الصحية المحلي وبيانات التواصل الخاصة به:

لمن هذه الإرشادات

تقدم هذه النشرة تمارين ونصائح أساسية للبالغين الذين أصيبوا بتوعلك شديد ودخلوا المستشفى بعد الإصابة بكوفيد-08 كما يوفر أيضا معلومات عن المجالات التالية:



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2	العناية بصعوبة التنفس	
4	تمارين ما بعد مغادرة المستشفى	
15	العناية بمشاكل الصوت	
16	العناية بالأكل والشرب والابتلاع	
17	العناية بمشاكل الانتباه والذاكرة والتفكير	
18	العناية بالنشاطات اليومية	
19	العناية بالضغط ومشاكل المزاج	
21	متى يجب عليك التواصل مع اخصائي الرعاية الصحية	

قد يشير أخصائي الرعاية الصحية الخاص بك إلى التمارين الانسب لك من هذه النشرة و يجب ألا تحل التمارين والنصائح الواردة في هذه النشرة محل أي برنامج تمرين فردي أو نصيحة قد تكون قد تلقيتها من قبل متخصصي الرعاية الصحية عند مغادرتك المستشفى.

يمكن لعائلتك وأصدقائك المساعدة في دعمك أثناء تعافيك، وقد يكون من المفيد مشاركة هذه النشرة معهم.



العناية بمشاكل ضيق التنفس

من الشائع أن تعاني من ضيق التنفس بعد دخول المستشفى. فقدان القوة واللياقة البدنية عندما كنت مريضاً، والمرض نفسه، يمكن أن يعني أنك تصاب بضيق التنفس بسهولة. الشعور بضيق التنفس يمكن أن يجعلك تشعر بالقلق، مما قد يجعل ضيق التنفس أسوأ. سيساعدك التزام الهدوء وتعلم أفضل طريقة للتحكم في ضيق التنفس.

يجب أن يتحسن ضيق التنفس لديك مع زيادة أنشطتك وتمارينك ببطء، ولكن في هذه الأثناء، يمكن أن تساعد التمارين والتقنيات أدناه أيضًا في إدارته.

**في حالة الشعور بزيادة في ضيق التنفس ولم تجد التمارين والتقنيات أي نفع يفضل التواصل
حالا مع اخصائي الرعاية الصحية الخاص بك**



وضعية تساعد على تحسين التنفس

هذه بعض الوضعيات التي قد تحسن من ضيق التنفس جرب كل منهم لمعرفة أيهما يساعدك. يمكنك أيضًا تجربة تقنيات التنفس الموضحة أدناه أثناء وجودك في أي من هذه الوضعيات

استلقاء على الجانب بشكل مرتفع :

الاستلقاء على جانبك مسندًا بوسائد داعمة
رأسك ورقبتك، مع ثني ركبتيك قليلاً.

الجلوس بشكل منحني الى الامام:

الجلوس على طاولة، انحن إلى الأمام من الخصر برأسك
ورقبتيك يستريح على الوسادة وذراعيك تستريح على
الطاولة. يمكنك أيضا محاولة هذا بدون الوسائد

الجلوس بشكل منحني الى الامام (من غير طاولة)

الجلوس على كرسي والانحن الى الامام للراحة ضع
ذراعيك في حضنك أو على ذراعي الكرسي

الوقوف بشكل منحني الى الامام:

اثناء الوقوف انحن للأمام على حافة الكرسي أو أي سطح
مثبت بأحكام أمامك

اسناد الظهر إلى الخلف في الوقوف:

اتكئ مع ظهرك على الحائط ويديك بجانبك وباعد بعض
الشي بين ركبتيك والحائط

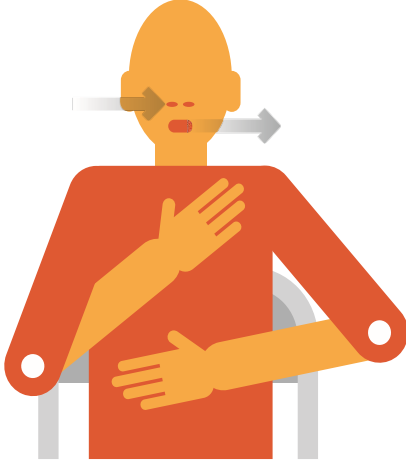


 <p>1. High side lying Lying on your side propped up by pillows, supporting your head and neck, with your knees slightly bent.</p>	
 <p>2. Forward lean sitting Sitting at a table, lean forwards from the waist with your head and neck resting on the pillow, and your arms resting on the table. You can also try this without the pillows.</p>	 <p>3. Forward lean sitting (no table in front) Sitting on a chair, lean forwards to rest your arms on your lap or the armrests of the chair.</p>
 <p>4. Forward lean standing While standing, lean forwards onto a windowsill or other stable surface.</p>	 <p>5. Standing with back support Lean with your back against a wall and your hands by your side. Have your feet about a foot away from the wall and slightly apart.</p>

تقنيات التنفس

هذه الاساليب سوف تساعدك على الاسترخاء والهدوء والتحكم في عملية التنفس:

- أجلس بوضع مريح ومدعوم
- ضع إحدى يديك على صدرك والأخرى على بطنك
- فقط إذا كان يساعدك على الاسترخاء، أغلق عينيك (وإلا اتركهما مفتوحتين) وركز على تنفسك
- تنفس ببطء من خلال أنفك (أو فمك إذا كنت غير قادر على القيام بذلك) وثم من خلال فمك.
- عندما تتنفس، ستشعر بأن اليد على معدتك ترتفع أكثر من اليد التي على صدرك.
- حاول أن تبذل أقل جهد ممكن واجعل أنفاسك بطيئة ومسترخية



التنفس ببطء

ويعد مفيد للممارسة عند تنفيذ الأنشطة التي قد تتطلب المزيد من الجهد أو تجعلك لاهثاً ، مثل صعود الدرج أو صعود التل إنه من المهم أن تتذكر أنه لا داعي للاستعجال.

- فكر في تقسيم النشاط إلى أجزاء أصغر لتسهيل القيام بها للخروج دون الشعور بالتعب الشديد أو ضيق التنفس في النهاية

— خذ شهيقاً قبل بذل "مجهود" النشاط، كما هو الحال قبل التسلق خطوة

—أخرج الزفير أثناء بذل الجهد مثل صعود الدرج

— قد تجد أنه من المفيد التنفس من خلال أنفك والزفير من خلال فمك



تمارين ما بعد مغادرة المستشفى

تعتبر التمارين جزءاً مهماً من التعافي بعد الإصابة بمرض كوفيد-08 الحاد. يمكن أن تساعد التمارين على:

- تحسين اللياقة
- تحسين التفكير
- التقليل من الإرهاق وتحسين المزاج
- التقليل من ضعف التنفس
- زيادة الثقة بالنفس
- زيادة قوة العضلات
- تحسين الطاقة
- تحسين الاتزان

ابحث عن طريقة للبقاء متحفزاً بتمارينك. قد يساعدك تتبع تقدمك من خلال 'تطبيق' يوميات أو تمرين على هاتفك أو ساعتك

التمرين بسلامة

تعتبر ممارسة الرياضة بأمان أمراً مهماً، حتى لو كنت مستقلاً في حركتك (المشي) وممارسة التمارين الأخرى قبل أن تمرض. من المهم بشكل خاص إذا كنت:

- واجهت صعوبة في حركتك قبل الذهاب للمشفى
- تعرضت لسقوط قبل الذهاب إلى المستشفى أو أثناء إقامتك في المستشفى
- لديك أي حالة صحية أخرى أو إصابة قد تعرض صحتك للخطر أثناء ممارسة الرياضة
- خرجت من المستشفى باستخدام الأكسجين الموصوف طبيًا.

في هذه الحالات، قد تحتاج إلى ممارسة الرياضة مع شخص آخر من أجل الأمان. يجب على أي شخص يحصل على أكسجين إضافي أن يناقش استخدامه للأكسجين أثناء التمرين مع أخصائي الرعاية الصحية قبل البدء.

ستساعدك هذه القواعد البسيطة على ممارسة الرياضة بأمان:

- الحرص على الإحماء قبل التمارين والراحة بعدها
- ارتداء ملابس فضفاضة ومريحة وأحذية داعمة
- الانتظار ساعة على الأقل بعد الوجبة قبل التمرين
- شرب الكثير من الماء
- تجنب ممارسة الرياضة في الطقس الحار
- ممارسة الرياضة في الداخل في الطقس البارد



وزارة الصحة Ministry of Health

إذا شعرت بأي من الأعراض التالية، فلا تمارس الرياضة أو توقف عن ممارسة الرياضة واتصل بإخصائي الرعاية الصحية الخاص بك:



— الغثيان

— الدوار

— ضيق شديد بالتنفس

— التعرق

— ضيق في الصدر

— ألم متزايد

تذكر الالتزام بقواعد التباعد الجسدي عند ممارسة الرياضة في الهواء الطلق، إذا كانت موجودة في المكان الذي تعيش فيه.

ممارسة الرياضة على المستوى الصحيح

لمعرفة ما إذا كنت تمارس الرياضة بالمستوى الصحيح، فكر في التحدث بجملة:

— إذا كنت تستطيع نطق الجملة بأكملها دون توقف ولا تشعر بضيق التنفس، فيمكنك ممارسة الرياضة بشكل أكثر صعوبة

— إذا كنت لا تستطيع التحدث على الإطلاق أو يمكنك نطق كلمة واحدة فقط في كل مرة وتشعر بضيق شديد في التنفس، فأنت تمارس التمارين الرياضية بشدة

— إذا كنت تستطيع نطق جملة وتتوقف مرة أو مرتين لإلتقاط أنفاسك وكان تنفسك متوسطاً إلى شديد تقريبا فأنت تمارس الرياضة في المستوى الصحيح

تذكر أنه من الطبيعي أن تشعر بضيق النفس عند ممارسة الرياضة، وأنه ليس ضاراً أو خطيراً. يمكنك أن تبدأ ببناء لياقتك تدريجياً على أن تصبح أقل ضيقاً في التنفس. من أجل تحسين لياقتك، يجب أن تشعر بضيق تنفس معتدل إلى شديد تقريباً عند ممارسة الرياضة.

وإذا كنت تشعر بضيق شديد في التنفس بحيث أنك لا تستطيع التحدث، يجب أن تبطئ وتأخذ قسطاً من الراحة حتى تشعر بأن تنفسك أكثر تحكماً. قد تجد مواضع تخفيف ضيق التنفس في الصفحة 2 مفيدة.

تمارين الإحماء

يهيئ الإحماء جسمك لممارسة الرياضة لمنع الإصابة. يجب أن يستمر إحماءك حوالي 4 دقائق، وفي النهاية يجب أن تشعر بضيق في التنفس. يمكنك أداء تمارين الإحماء في الجلوس أو الوقوف. إذا كنت تقوم بالإحماء وأنت واقف، فامسك بسطح ثابت للحصول على الدعم إذا لزم الأمر. كرر كل حركة 1-3 مرات.



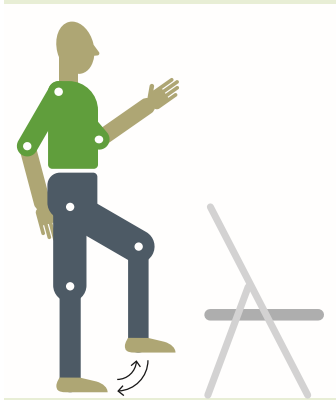


وزارة الصحة Ministry of Health

تمارين اللياقة

يجب أن تهدف إلى ممارسة تمارين اللياقة لمدة 1-2/ دقيقة، 4 أيام كل أسبوع. بعض الأمثلة على الأنواع المختلفة من تمارين اللياقة البدنية موصوفة أدناه ، ولكن أي نشاط يجعلك تشعر بضيق تنفس متوسط إلى شديد يمكن اعتباره ضمن تمارين اللياقة البدنية الخاصة بك. حدد وقتاً لممارسة اللياقة البدنية وزد مقدار الوقت الذي يمكنك إدارته تدريجياً. قد يكون هذا في زيادات صغيرة مثل 2/ ثانية إضافية أو دقيقة واحدة من النشاط. قد يستغرق الأمر بعض الوقت للعودة إلى مستوى النشاط الذي كنت عادة قادراً على القيام به قبل أن تصبح على ما يرام.

أمثلة على تمارين اللياقة البدنية



السير في مكانك :

- إذا لزم الأمر ، أمسك كرسي أو سطح مستقر من أجل الدعم ، وأترك كرسي قريب للراحة
- ارفع ركبتيك واحدة تلو الأخرى

المضي بهذا التمرين:

- قم بزيادة الطول الذي ترفعه فيه ساقيك بهدف أن تصل إلى ارتفاع الورك ، إن أمكن

متى يمكنك اختيار هذا التمرين:

- إذا لم تستطع الخروج للمشي
- إذا لم تكن قادراً على المشي لمسافة طويلة قبل أن تحتاج إلى الجلوس

القفزات:

استخدم الدرجة السفلية من درجك:

- إذا لزم الأمر ، أمسك الدرابزين للحصول على الدعم واترك كرسي قريب للراحة
- اخطوا لأعلى ولأسفل ، مع تغيير الرجل التي تبدأ بها كل 0/ خطوات

المضي بهذا التمرين:

- زيادة ارتفاع الدرجة أو سرعة الخطو للأعلى والأسفل
- إذا كان نشاطك جيداً بما يكفي للقيام بهذا التمرين دون التمسك ، يمكنك حمل الأثقال وأنت تخطو للأعلى والأسفل

متى يمكنك اختيار هذا التمرين:

- إذا كنت لا تستطيع الخروج
- إذا لم تكن قادراً على المشي لمسافة طويلة قبل الحاجة للجلوس

المشي:

- استخدم إطار المشي أو العكازات أو العصا إذا لزم الأمر
- اختر طريقاً مسطحاً نسبياً

المضي بهذا التمرين:

- زيادة السرعة أو المسافة التي تمشيها ، أو إذا أمكن ، قم بالسير بطريق منحدر إلى الأعلى في مسارك

متى يمكنك اختيار هذا التمرين:

إذا كان بإمكانك الخروج في الهواء الطلق لممارسة الرياضة

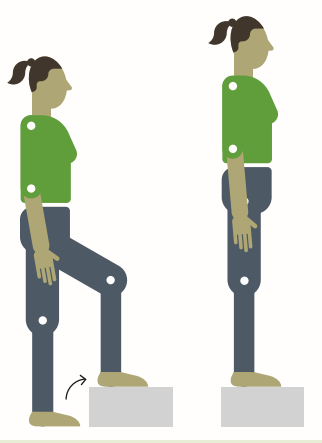
الركض أو ركوب الدراجات:

لا تقم بالركض أو ركوب الدراجات إلا إذا كان ذلك آمناً طبيياً لك



متى يمكنك اختيار هذا التمرين:

- إذا كان المشي لا يجعلك تعباً بما يكفي
- إذا كنت تستطيع الركض أو ركوب الدراجة قبل أن تصبح متعباً



تمارين التقوية

تساعد تمارين التقوية على تحسين العضلات التي أصبحت أضعف نتيجة مرضك. يجب أن تهدف إلى القيام بثلاث جلسات من تمارين التقوية كل أسبوع. لن تجعلك تمارين التقوية تشعر بضيق التنفس مثل تمارين اللياقة. بدلاً من ذلك ، ستشعر عضلاتك وكأنها عملت بجد.

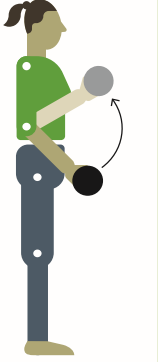
يجب أن تهدف إلى إكمال ما يصل إلى 2 مجموعات من 0/ تكرارات لكل تمرين ، مع أخذ قسط من الراحة بين كل مجموعة. لا تقلق إذا وجدت هذه التمارين صعبة. إذا كان ذلك الأمر ، فابدأ بعدد أقل من التكرارات في كل مجموعة وقم ببناء مجموعات من 0/ كلما تحسنت في التدريبات ، استخدم أوزاناً أثقل لجعل عضلاتك تعمل بجهد أكبر. يمكنك استخدام علب الطعام أو زجاجات الماء كأوزان.

بعض تمارين تقوية ذراعيك وساقيك موصوفة أدناه، والتي يمكن القيام بها في الجلوس أو الوقوف. يمكنك القيام بذلك بأي ترتيب. حافظ على وضعية جيدة، مع ظهرك مستقيماً وبطنك مطوياً، وأكمل التمارين ببطء. تذكر أن تأخذ الشهيق وأنت تستعد لأداء أصعب جزء من التمرين، والزفير وأنت تبذل الجهد.



وزارة الصحة Ministry of Health

ثني العضلة ذات الرأسين



- مع ذراعيك بجانبك ، حافظ على وزن في كل منهما مع ابقاء راحتي يديك مواجهة للأمام
- حافظ على الجزء العلوي من ذراعك ثابتاً . ارفع برفق الجزء السفلي من كلا الذراعين

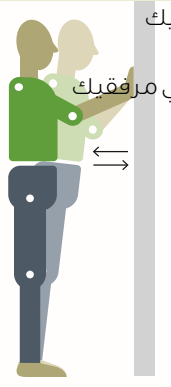
(الانحناء عند المرفقين) وارفع الأثقال

- يمكنك القيام بهذا التمرين جالساً أو واقفاً

المضي بهذا التمرين:

- زيادة الوزن الذي تستخدمه أثناء القيام بذلك التمرين

الدفع قبالة الجدار

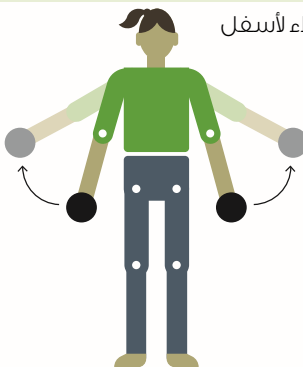


- ضع يديك بشكل مسطح على الحائط على ارتفاع الكتف ، مع توجيه الأصابع لأعلى ، ووضع قدميك على بعد حوالي قدم من الحائط
- حافظ على جسمك مستقيماً في جميع الأوقات ، وأنزل جسمك ببطء نحو الحائط عن طريق ثني مرفقيك
- ثم ادفع برفق بعيداً عن الحائط مرة أخرى ، حتى تستقيم ذراعيك

المضي بهذا التمرين:

- قف بعيداً عن الحائط

رفع الذراع إلى الجانب



- امسك ثقلاً في كل يد ، وذراعيك على جانبيك مع ابقاء راحتي يديك للداخل
- ارفع كلا الذراعين إلى الجانب ، حتى مستوى كتفك (ولكن ليس أعلى) ، ثم انزل ببطء لأسفل
- يمكنك القيام بهذا التمرين جالساً أو واقفاً

المضي بهذا التمرين:

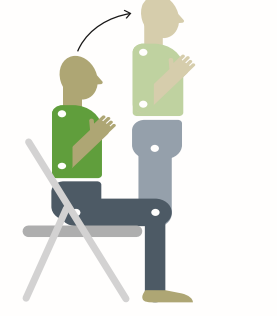
- قم بزيادة الطول الذي ترفعه بذراعيك ولكن ليس أعلى من مستوى كتف



أمثلة على تمارين تقوية الذراعين

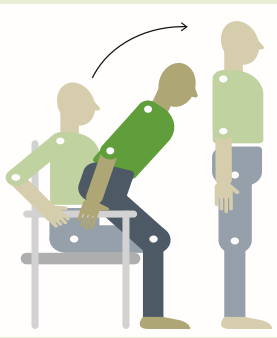
الجلوس والوقوف

- الجلوس والحرص على استقامة الظهر مع وضع الذراعين بالجانب أو على الصدر،
- والوقوف ببطء، وتثبيت الوضعية لعد 2، والجلوس ببطء إلى أسفل على الكرسي .
- إبقاء قدميك على الأرض في جميع أنحاء.
- إذ لم تستطع الوقوف بدون استخدام ذراعيك، جرب كرسي أعلى.
- إذ لازل صعب فالبداية، يمكنك الدفع بمساعدة ذراعيك



للتطور في التمرين:

- جعل الحركة بطيئة قدر الإمكان
- أداء التمرين باستخدام كرسي أقصر
- حمل وزن بالقرب من صدرك أثناء القيام بممارسة



استقامة الركبة :

- الجلوس على كرسي مع قدميك معا. تصويب ركبة واحدة وتثبيت ساقك على التوالي للحظة، ثم خفض ببطء. كرر مع ساقك الأخرى.

للتطور في التمرين:

- زيادة وقت تثبيت الساق والعد إلى 2
- أداء التمرين بحركة أبطئ



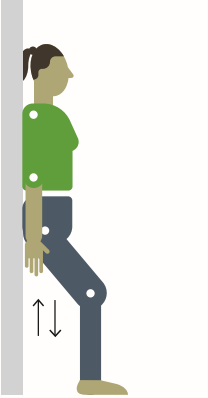


وزارة الصحة Ministry of Health

تمرين القرفصاء

قف مع تثبيت ظهرك على الجدار او سطح مستقر آخر وأقدامك منفصلة قليلا، حرك قدمك ما يقارب قدم وبعيدا عن الحائط. بدلا من ذلك ضع يديك على كرسي مستقر.

- إن الحفاظ على استقامة ظهرك على الجدار، أو التمسك بالكرسي، يؤدي ببطء إلى انحناء ركبتيك على مسافة قصيرة؛ ظهرك سوف ينزلق أسفل الجدار. أبقِ وركيك أعلى من ركبتيك.
- توقف للحظة قبل أن تستقيم ركبتيك مرة أخرى ببطء



للتطور في التمرين:

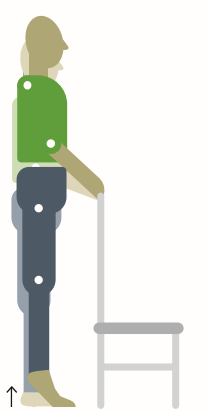
- زيادة المسافة التي تنحني بها ركبتيك (تذكر أن تبقى وركيك أعلى من ركبتيك)
- زد الوقت الذي تتوقف فيه إلى عدد 2 قبل تعديل ركبتيك

تمرين رفع الكعب

وضع يداك على سطح مستقر لدعم توازنك، لكن لا تميل عليهم. انهض ببطء إلى أصابع قدميك، وانخفض ببطء إلى أسفل مرة أخرى

للتطور في التمرين:

- قف على أصابع قدميك والعد الى 2
- قف على ساق واحدة في كل مرة





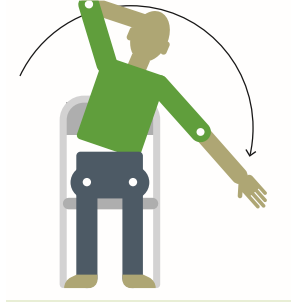
وزارة الصحة Ministry of Health

تمارين الاطالة

تهدئة التمارين تسمح لجسديك بالعودة إلى طبيعتك قبل إيقاف التمارين الرياضية يجب أن تستمر اطالتك. حوالي 4 دقائق، ويجب أن يعود تنفسك إلى طبيعته بحلول النهاية. جرب العمل من خلال كل هذه الاقتراحات، ولكن إذا كنت لا تستطيع إدارة كل التمارين أو التمديدات، قم بالتمارين التي يمكنك القيام بها.

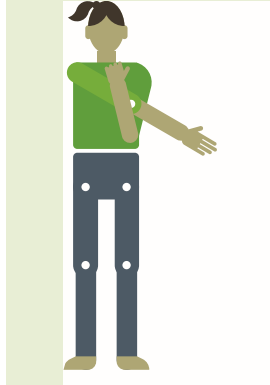
- 1- المشي بسرعة أبطأ أو تحريك القدمين في نفس المكان، لمدة 1 دقائق تقريبا
- 2- كرر تمارين الاحماء لتحريك مفاصلك، ويمكن القيام بذلك في الجلوس أو الوقوف
- 3- تمديد العضلات:

تمدد عضلاتك يمكن أن يساعد على تقليل أي ترنج قد تشعر على مدى واحد إلى يومين بعد التمرين يمكنك القيام بهذه الامتدادات في الجلوس أو الوقوف. كل امتداد يجب أن يتم برفق، ويجب أن تمسك كل واحدة لمدة 04-1/ ثانية.



الجانب:

تصل ذراعك اليمنى إلى السقف ثم تميل إلى اليسار قليلا، يجب أن تشعر بالامتداد على طول الجانب الأيمن من جسديك. عد إلى موقع البداية وكرر على الجانب



الكتف:

ضع ذراعك أمامك. ابق ذراعك مستقيمة، اجعلها حول جسديك في ارتفاع الكتف، مستخدم يدك الأخرى لضغط ذراعك على صدرك حتى تشعر بالامتداد حول كتفك. العودة إلى موقع البداية، وتكرار على الجانب المقابل



وزارة الصحة Ministry of Health



الفخذ الخلفي (هامسترينغ)

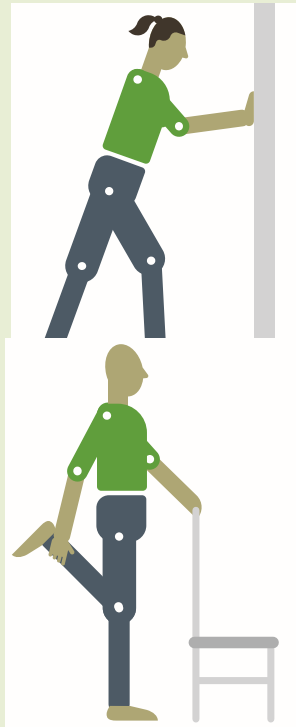
الجلوس على حافة الكرسي مع ظهر مستقيم وقدمين مسطحة على الأرض. ضع ساقك امامك مباشرة مع الكعب على الأرض. ضع يديك على فخذك الآخر كدعم. الجلوس على أطول ما يمكن، انحني قليلا إلى الأمام في الوركين حتى يمكنك أن تشعر تمدد طفيف أسفل الجزء الخلفي من الساق التي تمدد. العودة الى موقع البداية، وتكرار على الجانب المقابل.

الساق السفلي

قف مع اقدام بعيدة عن الجدار واستند عليه. ابق جسدك مستقيظا وخطوة ساق واحد خلفك. مع كل القدمين مواجهة للأمام، انحني ركبتيك الأمامية، الحفاظ على ساقك الخلفية مستقيمة وكعبك على الأرض. يجب أن تشعر بالتمدد في الجزء الخلفي من أسفل رجلك.

الفخذ الامامي

قف وتمسك بشيء مستقر للدعم ثني ساق واحدة خلفك، اذ كنت تستطيع الوصول إليها، استخدم اليد على نفس الجانب لتمسك كاحلك او اخر رجلك. ابق ركبتيك قريبتين وظهرك مستقيم. عد الى موقع البداية وكرر على الجانب المقابل. ويمكنك أيضا ان تفعل هذا التمدد جالس على كرسي مستقر: الجلوس بالقرب من مقدمة الكرسي، إلى جانب واحد (بحيث تجلس على نصف الكرسي فقط). انزلق الساق الأقرب الى حافة الكرسي ويضعه بحيث ركبتيك تشير إلى أسفل بالتطابق مع الورك ووزنك خلال أصابع قدمك. يجب أن تشعر بالامتداد على طول مقدمة فخذك.



العناية بمشاكل الصوت

قد يواجه البعض صعوبات في استخدام اصواتهم بعد تهويتهم (وجود أنبوب تنفس). إذا كان صوتك خفيف أو ضعيف، فمن المهم أن:

- استمر بالكلام إذا كان الوضع مريح، ويجب عليك الالتزام باستخدام صوتك لتتحسن. في حال كنت تتعب أثناء التحدث، خذ استراحة ودع أصدقائك وأفراد عائلتك يعرفون أنك تحتاج إلى التوقف وإراحة صوتك خلال المحادثات.
- لا تضغط على صوتك ولا تهمس لأن هذا يمكن أن يوتر الحبال الصوتية الخاصة بك. حاول ألا ترفع صوتك أو تصرخ، إذا كنت بحاجة للحصول على انتباه شخص ما، حاول صنع ضوضاء باستخدام الجمادات
- خذ قسط من الراحة إذا نفذ منك النفس أثناء الحديث، وكن حذرا من العمل بجهد أكبر. توقف واجلس بهدوء بينما تركز على تنفسك. جرب إستراتيجيات التنفس الموصوفة سابقاً في هذا المنشور، وقم بها حتى تشعر أنك مستعد للتحدث مرة أخرى.
- حاول أن تتدرب على استخدام صوتك، واحرص ألا تجهده
- استخدام طرق أخرى للتواصل، مثل الكتابة، وارسال الرسائل النصية، أو استخدام الإيماءات، إذا كان الكلام صعباً أو غير مريح.
- اشرب الماء خلال اليوم للمساعدة على تحسين صوتك



والابتلاع

في حال وضع أنبوب التنفس لك حينما كنت في المستشفى، قد تلاحظ أن لديك بعض الصعوبات في ابتلاع الطعام والشراب، وذلك لأن العضلات التي تساعدك على الابتلاع ربما أصبحت ضعيفة. لذا فإن الأكل الصحي وشرب الماء أو العصير مهم

إن الاهتمام بالابتلاع مهم لتجنب الاختناق والتهابات الرئة، وهذا يمكن أن يحدث إذا ذهب الطعام أو الشراب الطريق الخطأ ويدخل إلى رئتيك عندما تبتلع. إذا واجهت صعوبة في الابتلاع، فإن هذه التقنيات قد تساعد

والشرب

الأكل

- لا تستلق تأكد من الوقوف أو المشي أو الجلوس لمدة 2/ دقيقة على الأقل بعد تناول وجبات الطعام.
- حاول أن تجرب الأطعمة المختلفة (السميكة والرقيقة) لمعرفة ما إذا كان ابتلاع بعض الأطعمة أسهل من ابتلاع الأطعمة الأخرى. قد يساعد في اختيار الأطعمة اللينة أو السلسة أو الرطبة في البداية، أو تقطيع الأطعمة الصلبة إلى قطع صغيرة جداً.
- ركز عندما تأكل أو تشرب وحاول تناول وجباتك في مكان هادئ،
- خذ وقتك عند الأكل خذ قضمات صغيرة من الطعام ورشقات صغيرة من الشراب أثناء الأكل، وامض جيداً قبل أن تبتلع.
- تأكد من أن فمك خال من بقايا الطعام قبل تناول قضمه أو رشفة أخرى.
- تناول وجبات صغيرة طوال اليوم إذا تعبت من تناول وجبات كاملة.
- إذا كنت تعاني من السعال أو الاختناق، أو يصبح تنفسك صعباً عندما تأكل وتشرب، خذ استراحة للتعافي.

تناول الطعام الصحي مهم جدا لتعافيك ، خصوصا عندما تكون ضعيفا أو على جهاز التنفس في المستشفى. تنظيف



أسنانك بعد كل وجبة يساعد على بقاء فمك صحي بحالة جيدة



في حال لازلت تواجه من آلام أثناء الأكل أو الشرب، تواصل مع معالجك الصحي



العناية بمشاكل الانتباه، والذاكرة، والتفكير

إنه من الشائع للغاية للأشخاص الذين كانت حالتهم الصحية غير جيدة، وخاصة أولئك الذين استخدموا أنبوب تنفس في المستشفى، أن يواجهوا صعوبات جديدة مع الانتباه، وتذكر الأشياء، والتفكير بوضوح. وقد تزول هذه الصعوبات في غضون أسابيع أو أشهر، ولكن بالنسبة لبعض الناس، قد تستمر لفترة أطول.

من المهم أن تدرك أنت وأسرته ما إذا كنتم تواجهون هذه الصعوبات، لأنها يمكن أن تؤثر على علاقاتكم وأنشطتكم اليومية وعودتكم إلى العمل أو التعليم.

وإذا واجهتم هذه الصعوبات، فإن هذه التقنيات قد تساعد:

- **التمارين البدنية** يمكن أن تساعد عقلك على التعافي مما قد يكون صعباً إذا كنت تعاني من الإرهاق، أو صعوبة التنفس، أو التعب، حاول تدريجياً إدخال التمارين الرياضية البسيطة في روتينك اليومي. وتعد تمارين اللياقة البدنية والتعزيز التي سبق وصفها في هذا المنشور مكان جيد للبدء فيها
- **تمارين الدماغ** مثل الهوايات أو الأنشطة الجديدة، والألغاز، وألعاب الكلمات والأرقام، وتمارين الذاكرة، والقراءة قد تساعد . ابدأ بتمارين الدماغ التي تتحدثك، ولكنها قابلة للتحقيق ويعد ذلك مهما للحفاظ على دوافعك.
- **أحط نفسك بالقوائم** والملاحظات والتنبيهات مثل المنبهات الهاتفية التي يمكن أن تذكرك بالأشياء التي تحتاج القيام بها
- **تقسيم الأنشطة** إلى أقسام صغيرة لتجنب الشعور بالإرهاق، بعض الاستراتيجيات المدرجة أدناه لإدارة أنشطة الحياة اليومية قد تساعدك أيضا في التعامل مع تأثير المشاكل في التركيز والذاكرة والتفكير بوضوح مثل تعديل توقعاتك والسماح للآخرين بمساعدتك

إدارة أنشطة الحياة اليومية

ومن المهم أن تصبح نشطا مرة أخرى عندما تتعافى، وقد يكون ذلك صعبا إذا كنت تشعر بالتعب الشديد أو تعاني من الصعوبة بالتنفس، أو الضعف العام، ويعد ذلك أمرا طبيعيا. كما أن جميع النشاطات التي تقوم بها بما في ذلك غسل الملابس، وإعداد الوجبات، والعمل واللعب، تستهلك طاقة الجسم



د تأخذ جهدا

بعد مرض عضال، قد لا يكون لديك نفس الطاقة التي اعتدت عليها، وبعض المهام قد أكبر من ذي قبل.

وإذا واجهت هذه الصعوبات، فإن هذه التقنيات قد تساعد:

- **تعديل توقعاتك** لما يمكنك فعله في يوم واحد. وضع أهداف واقعية على أساس وضعك الصحي فعندما تكون متعبا جدا، أو تعاني من صعوبة في التنفس، أو الضعف العام. حتى النهوض من السرير، والاعتسال، واللباس تعد إنجازا.
- **وفر طاقتك** عن طريق القيام بمهام الجلوس عندما تستطيع، مثل عند الاستحمام، أو ارتداء الملابس، أو إعداد الطعام. حاول ألا تقوم بمهام تحتاج أن تقف، تنحني، تمتد، أو تتفرص لفترة طويلة.
- **وازن بين مهامك**، وحاول أن تقوم بمهام بسيطة أثناء قيامك بمهام صعبة وخصص وقت في اليوم للراحة
- **دع الآخرين يساعدوك** في المهام التي قد تعاني معها. مثل رعاية الأطفال، التسوق، إعداد وجبات الطعام، أو القيادة قد تكون صعبة. تقبل عروض الدعم وأعلم الناس بما يمكنهم مساعدتك فيه. والخدمات التي يمكن أن تساعدك مثل التسوق أو الطبخ، قد تكون مفيدة أيضا بينما لا تزال تتعافى.
- **من السهل العودة إلى الأنشطة** لا تحاول القيام بأنشطة كاملة حتى تشعر أنك على استعداد. وقد يعني ذلك التحدث إلى رب العمل بشأن العودة التدريجية إلى العمل، والاضطلاع بدور يسهل عليك إدارته، والحصول على دعم لرعاية الأطفال، والعودة إلى الهوايات ببطء.



معالجة التوتر أو القلق أو الاكتئاب

إن فترة مرضك وبقائك بالمستشفى مرهقة للغاية ويمكن أن يكون لها تأثير سلبي على مزاجك. وليس من غير المعتاد أن نتعرض لمشاعر التوتر أو القلق (القلق، والخوف) أو الاكتئاب (انخفاض المزاج، والحزن). ذكريات تجربتك في المستشفى قد تراودك حتى عندما تتناسها وقد يتأثر مزاجك بسبب مما قد يؤدي إلى عدم قدرتك على العودة إلى أنشطتك اليومية بالطريقة التي ترغب بها.

وقد تؤثر هذه المشاعر السلبية بدورها على قدرتك على المشاركة في الأنشطة اليومية. وخاصة إذا كنت أقل حماسا بسبب الفرق بين توقعاتك وما يمكن تحقيقه



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وبالتالي فإن العناية بمشاعر القلق والاكتئاب تشكل جزءا هاما من تعافيتكم الشامل. هناك بعض الأشياء البسيطة التي يمكن أن تساعدك على تخطي ذلك:

الاهتمام باحتياجاتك الرئيسية

— **الحصول على ما يكفي من النوم** كما أن لشعور بالتوتر يمكن أيضا أن يؤثر على نومك. حاول العودة إلى وقت النوم والاستيقاظ العادي، باستخدام أجهزة التنبيه لتذكيرك. يمكنك أو عائلتك ضمان أن بيئتك خالية من الأشياء التي قد تزعجك، مثل الكثير من الضوء أو الضوضاء. إن التقليل من النيكوتين (مثل من التدخين)، والكافيين، والكحول، وإضافة استراتيجيات الاسترخاء، من شأنه أن يساعدك في النوم العميق

— **الأكل الكافي والصحي** مهم لصحتك الشاملة، إذا كنت تواجه صعوبات في الأكل أو الابتلاع اتبع النصائح المقدمة في هذا المنشور أو من قبل محترف الرعاية الصحية

— **النشاط البدني** يقلل من فرصة الإصابة بالاكتئاب وينصح باتخاذ خطوات صغيرة في زيادة تدريجية وأمنة نشاطك البدني.

العناية بالذات

— **إبقاء العلاقات الاجتماعية** مهم لصحتك العقلية. والحديث مع الآخرين يمكن أن يساعد في الحد من الاكتئاب وقد يساعدكم أيضا في إيجاد حلول للتحديات في رحلة التعافي. إذا كنت تعيش بمفردك، البقاء على اتصال مع الأصدقاء أو العائلة على الهاتف أو على الإنترنت يمكن أن يساعدك على عدم الشعور بالوحدة ولأنك قد لا ترغب بأن تكون مرتبطا اجتماعيا عندما تكون في مزاج سيئ، دع العائلة والأصدقاء يعرفون أن بإمكانهم المساعدة من خلال التواصل معك أثناء شفائك.

— **القيام بأنشطة الاسترخاء**، مثل الاستماع إلى الموسيقى، القراءة، أو الممارسات الروحية. بالإضافة إلى التنفس البطيء تساعد على الحد من الاكتئاب. كم ينبغي القيام بذلك تدريجيا إذا كان الأمر صعبا للغاية. في البداية، اتبع "تمارين التنفس المتحكم" التي وصفت في وقت سابق في هذا المنشور لتعلم كيفية القيام بالتنفس البطيء.

— **زيادة الممارسة** تدريجيا في الأنشطة اليومية أو الهوايات مما قد يساعد على تحسين المزاج.



متى يجب عليك اللجوء لمقدم الرعاية الصحية

يجب عليك التواصل مع مقدم الرعاية الصحية في الحالات التالية:

— **إذا كان هناك تغير** في حالة التنفس التي لا تتحسن باستخدام تقنيات التحكم في التنفس الموصوفة في الصفحة 3.

— **إذا أصبح النفس قصيرا** جدا مع ضعف في النشاط الذي لا يتحسن مع أي من تقنيات التحكم التنفس الموصوفة في الصفحة 2 أو إذا كنت تعاني من أي من الأعراض الموصوفة في الصفحة 5 قبل أو أثناء التمارين الرياضية.

— **إذا كان انتباهك**، أو ذاكرتك، أو تفكيرك، أو مزاجك لا يتحسن، مما يجعله من الصعب عليك القيام بأنشطتك اليومية، أو يمنعك من العودة إلى العمل أو القيام بمهام أخرى.

— **إذا أصبح مزاجك** يزداد سوءا، خصوصا إذا استمر لعدة أسابيع



-2

استبيان التقييم المبدئي
ما بعد الإصابة بفيروس كورونا

1. تاريخ الإصابة بفيروس كورونا

.....

2. المدينة

- الرياض
- مكة المكرمة
- جدة
- المدينة المنورة
- الطائف
- حائل
- القصيم
- الجوف
- الاحساء
- المنطقة الشرقية
- الحدود الشمالية
- حفر الباطن
- القرية
- القنفذة
- ابها
- جازان
- بيشة

3. الجنسية

- سعودي
- غير سعودي

4. العمر

.....

5. الجنس

- ذكر
- انثى

6. هل انت موافق

- موافق
- غير موافق
- متوفي

7. المستوى التعليمي

- أمي
- يقرأ ويكتب/ ابتدائي
- شهادة المتوسطة



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- شهادة الثانوية
- جامعي او اعلى
- 8. الحالة الاجتماعية**
- متزوج
- أعزب
- مطلق / أرمل
- 9. المهنة**
- طالب
- غير موظف / ربة منزل
- ممارس صحي
- عمل مع الجمهور (اشتغل مع العامة)
- وظيفة اخرى
- 10. هل انت مدخن**
- حالياً أذخ السجارة
- حالياً استخدم الشيشة
- مدخن سابق
- غير مدخن
- التدخين السلبي (الدخان غير المباشر)
- 11. الوزن**
- 12. الطول**
- 13. مؤشر كتلة الجسم**
- نقص الوزن
- الوزن الطبيعي
- زيادة الوزن
- سمنة
- 14. الاعتلال المشترك (هل لديك اكثر من مرض مزمن)**
- نعم
- لا
- 15. الامراض المزمنة**
- لا يوجد
- أي من أمراض المناعة الذاتية (مرض كرون، مرض التقرح)
- الأدوية المثبطة للمناعة
- سرطان
- غسيل كلى او زراعة كلى
- مرض السكري
- ارتفاع ضغط الدم
- اضطرابات الجهاز التنفسي (مرض الانسداد الرئوي المزمن - الربو)
- مرض نقص تروية القلب
- فشل القلب
- اضطرابات نظم قلب
- الأمراض الرئوية الخلالية
- السكتة الدماغية
- امراض الكبد
- 16. عدد الامراض المزمنة لديك**-----
- 17. تاريخ الادوية الحالي**



نعم

لا

18. ماهي (التقييم الطبيب ، وإذا كان المريض يعلم)-----

19. تحصين ضد كورونا

لا

- نعم جرعه واحدة
- نعم جرعتين
- نعم ثلاث جرعات
- سبق وان أصبت بالعدوي

20. اعراض فيروس كورونا

- بدون اعراض
- ظهور اعراض

21. اعراض فيروس كورونا خلال الإصابة

- لا يوجد اعراض
- سعال
- حرارة
- ضيق في التنفس
- ألم في الصدر
- سيلان او احتقان الانف
- التهاب في قرنية العين
- انسداد في الأذن
- فقدان التذوق
- اسهال
- امسك
- غثيان وقيء
- ألم في البطن
- فقدان الشهية
- ارهاق
- طفح جلدي
- صعوبة في النوم
- صداع
- صعوبة في التركيز
- دوخة
- مشاكل في الذاكرة
- غبش في النظر
- ألم في العضلات
- تعرق بالليل
- أخرى

أخرى اذ وجد، ماهي -----

22. المضاعفات الحادة التي تهدد الحياة، مثل

- لا يوجد
- الانسداد الرئوي
- احتشاء عضلة القلب
- خلل النظم
- التهاب عضلة القلب وفشل القلب
- السكتة الدماغية
- النوبات
- التهاب الدماغ



- تليف الرئة
- اضطراب عصبي
- التدهور الشديد في الصحة النفسية

23. هل قمت بإجراء أي من الفحوصات التالية

- أشعة عادية علي الصدر
لا - نعم وكانت طبيعية - نعم وكانت غير طبيعية
- تحاليل طبية
لا - نعم وكانت طبيعية - نعم وكانت غير طبيعية
- أشعة مقطعية علي الصدر
لا - نعم وكانت طبيعية - نعم وكانت غير طبيعية

24. العلاج

- في المنزل
- هل قمت بزيارة أي مركز رعاية صحية بعد التشخيص الاولي
- هل تم ادخالك المستشفى بسبب كورونا
- زرت الطوارئ بدون تنويم بالمستشفى
- احتجت علاج بالأكسجين
- تم حجزك بوحدة العناية المركزة
- هل احتجت للتنفس الصناعي
- أخرى

25. مدة الإقامة في المستشفى بالأيام

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26. مدة الإقامة في العناية المركزة بالأيام

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27. بعد الخروج من المستشفى هل

- تم ادخالك مره أخرى بسبب كورونا
نعم لا
- تم اعطائك موعد متابعة
نعم لا
- تم زيارة أي مركز رعاية صحية بعد خروجك من المستشفى
نعم لا

28. شدة الإصابة بفيروس كورونا

- حرجة
- شديد
- غير شديد

29. اعراض ما بعد الإصابة بفيروس كورونا

- لا توجد أعراض
- صداع الراس
- إرهاق



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- اضطرابات الانتباه
- سعال
- ضيق التنفس
- ألم صدر
- الغثيان أو القيء
- فقدان حاسة الشم
- فقدان التذوق
- فقدان السمع وطنين الأذن
- اضطرابات هضمية
- إسهال
- إمساك
- تساقط الشعر
- وجع بطن
- فقدان الشهية / فقدان الوزن
- احمرار العين
- قشعريرة
- حمى
- تعرق
- طفح جلدي
- اضطرابات النوم
- توقف التنفس أثناء النوم
- دوخة
- مشاكل في الذاكرة
- رؤية مشوشة
- ألم المفاصل
- تورم في الأطراف
- ألم
- فقدان حاسة التذوق
- اضطرابات الدورة الشهرية
- سرعة التنفس
- الأمراض النفسية
- أخرى

30. أخرى

.....

31. الحالة الصحية للمريض مقارنة بما قبل الإصابة بفيروس كورونا

- عدت الى الحالة الصحية الى قبل الإصابة بكورونا
- لا يزال لدي بعض الاعراض

32. كم من الوقت استغرقت العودة إلى الحالة الصحية (الأساسية) بأيام

.....

33. كيف تأثرت حياتك اليومية بفيروس كورونا

- درجة - ليس لدي اي اعاقه بحياتي اليومية ولا يوجد اي اعراض الم قلق تتعلق بالعدوي
- درجة ا - لدي اعاقه لا اذكر في حياتي اليومية حيث يمكنني القيام بكل المهام والانشطة على الرغم من انني لا يزال لدي اعراض مستمرة الم قلق اكتئاب



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- درجة ٢- اعاني من اعاقه في حياتي اليومية حيث احتاج احيانا لتجنب المهام او الانشطة المعتادة او احتاج لتوزيعها على مدار الوقت بسبب الم قلق اكتئاب وعلى الرغم من ذلك قادر علي الاعتناء بنفسني بدون مساعده
- درجة ٣- اعاني من اعاقه في حياتي اليومية وانا لست قادر علي اداء جميع المهام بسبب اعراض قلق الم اكتئاب وعلى الرغم من ذلك قادر علي الاعتناء بنفسني بدون مساعده
- درجة ٤- اعاني من قيود شديده وانا لست قادر علي رعاية نفسي واحتاج المساعدة من شخص اخر بسبب الم اكتئاب قلق

34. الوضع الحالي لضيق التنفس

- أسوأ مما كان عليه قبل الإصابة بفيروس كورونا
- نفس ما قبل الإصابة بفيروس كورونا
- أفضل مما قبل الإصابة بفيروس كورونا

35. بخصوص الاعراض التنفسية اختر واحده مما يلي

- لا يوجد
- تعاني من ضيق تنفس مع التمارين الشاقة
- تعاني من ضيق تنفس عند الإسراع في المشي على سطح مستوي او المشي على انحدار خفيف
- تتوقف لأخذ نفس بعد المشي لبطء دقائق او ٩٠ متر
- صعوبة في التنفس تمنعك من الخروج من المنزل
- ضيق في التنفس عند ارتداء الملابس

36. هل تعاني اي من الاعراض الاتية لأكثر من نصف الوقت					
لا يوجد	طفيف	خفيف	وسط	شديد	
					مشاكل قصيرة المدى في الذاكرة أو التركيز لأكثر من نصف الوقت
					التهاب الحلق لأكثر من نصف الوقت
					التهاب الغدد الليمفاوية (في الرقبة أو الإبط أو الفخذ) لأكثر من نصف الوقت
					ألم في العضلات لأكثر من نصف الوقت
					صداع لأكثر من نصف الوقت
					صعوبة النوم أو النوم المنعش لأكثر من نصف الوقت
					التعب الشديد بعد التمرين أو المجهود الخفيف لأكثر من نصف الوقت
					الم المفاصل



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37. على مدار الأسبوعين الماضيين هل

	دائما = 5	أكثر الأحيان = 4	أكثر بقليل من نصف الوقت = 3	أقل بقليل من نصف الوقت = 2	قليل من الوقت (نادرا) = 1	بشأننا = 0
كنت سعيدا وبمزاج جيد	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
كنت أشعر بالهدوء والاسترخاء	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
كنت أشعر بالحيوية و بالتشاط	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
كنت استيقظ مرتاحا ونشطا	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
كانت أيامي مليئة بأشياء محببة لنفسى	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

38.

	أبدا	بعض الأيام	أكثر من نص الأيام (أكثر من سبعة)	كل يوم تقريبا
شعرت بقله او فقدان الاهتمام او الاستمتاع بممارسه الأشياء	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الشعور بالحزن او اليأس	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39.

	أبدا	بعض الأيام	أكثر من نص الأيام (أكثر من سبعة)	كل يوم تقريبا
هل تشعر بالغضب او القلق او الانفعال الشديد	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
عدم قدره علي انهاء القلق او التحكم فيه	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. يحتاج المريض الى

- لا شئ
- الاطمئنان
- الرعاية الداعمة (يمكن وصف الأدوية)
- إعادة التأهيل (المستشفيات الافتراضية)
- رعاية نفسية (مستشفيات افتراضية)
- يُحال إلى مركز الرعاية الصحية الأولية (تقييم سريري ومختبري كامل)
- يُنقل إلى الرعاية السريرية بعد كوفيد-08 في المستشفيات

III) Additional Sources

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- ❖ Trisha Greenhalgh and Matthew Knight (2020). **Long COVID: A Primer for Family Physicians**. American Family Physician website at www.aafp.org/afp. Copyright © 2020 American Academy of Family Physicians. For the private, noncommercial use of one individual user of the website. All other rights reserved. Contact copyrights@aaafp.org.
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- ❖ “A guide to preventing and addressing social stigma associated with COVID-19”
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